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ANNUAL REPORT

MADE TO THE

URBAN SANITARY AUTHORITY

OF THE

BOROUGH OF LEEDS,

FOR THE YEAR

1893.

BY

J. SPOTTISWOODE CAMERON,
M.D., B.Sc., &c.,
Medical Officer of Health to the Borough.

[REVISED EDITION.]

LEEDS:
JOWETT & SOWRY, Printers and Lithographers, 78, Albion Street.

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REPORT

OF THE

Medical Officer of Health.

For the Fifty-two weeks ended December 30th, 1893.

To the Chairman of the Sanitary Committee.

SIR,

The Sanitary Committee have already received a short report upon the health of Leeds during 1893. This report was generally to the effect that though, owing to special circumstances (amongst which were the prevalence of measles in the earlier part of the year, and the high mortality from diarrhœa which occurred during the hot autumn), the improvement in the health of the town which had been indicated by the very low death-rate of 1892, appeared to have been to some extent arrested. I propose now to furnish you with a more detailed report on the health of Leeds in 1893.

As in the report for last year, the matter dealt with will be divided into five parts. The first part will deal generally with conditions affecting the health of the City as a whole, and will include a comparison between the vital statistics of Leeds for 1893, and those of former years, with the mortality from certain groups of causes. It will include also a general comparison as to the births and deaths in Leeds with those for the country at large, and specially for the other large cities. This part of the report will also contain a few paragraphs dealing with the age, sex, and trade of the inhabitants of Leeds, and the manner in which these affect the death-rate of the city, with a suggestion for a correction factor for occupations. The remainder of this part of the report will deal with the mortality at different ages.

Part two, as last year, will deal with special diseases, and in this part information will be given in regard to certain illnesses and groups of illnesses, not only as to their prevalence in the several parts of the year, but also, in most cases, a few remarks will be offered as to the comparative mortality from these causes; and the conditions met with in houses visited on account of illness or death will be found recorded. As in previous reports the diseases most conspicuous during the year will be dealt with in greater detail, and I would specially direct your attention to some information furnished here in regard to the prevalence of diarrhœa.

The third part of the report will deal with the city in districts; first, as to the general mortality in the municipal wards; second, somewhat more in detail as to the causes of death in the registration sub-districts; and, third, with the health conditions found in certain localities. In this part will also be found a summary of the sanitary condition discovered upon examination of houses on account of illness or death.

The fourth part will show the work done in the various sub-departments presided over by the Sanitary Committee; and the fifth will contain a record of the reports submitted to the Authority, and a few recommendations, some of which may be new, but of which others have been already laid before you on a previous occasion.

Certain tables of a more or less general kind will be found in the appendix, but those dealing with special subjects are placed in the text. As far as possible the numbering of the tables will correspond to that of previous years. Arabic numerals will distinguish the tables in the first three parts of the report, Roman numerals those in the fourth part, dealing with departmental work; whereas the tables in the appendix will be distinguished by letters of the alphabet. This division of the report into sections is adopted to enable me to lay some of the more important parts before the Committee at once, without waiting for the completion of every detail.

APR

PART 1.—GENERAL.

Births.—During the 52 weeks of 1893, 12,348 births were registered as having occurred in the city. Calculated upon the population, as estimated by the Registrar-General to the middle of the year, this is equivalent to an annual rate* of 32·4 per 1,000 inhabitants. The corresponding rate for England and Wales was 30·8. Our own birth-rate was 1·1 below that of the preceding year, while the rate for England and Wales was greater than it had been in 1892.

Deaths.—The deaths registered in Leeds during the same period were 8,488. To these we must add the deaths of 24 persons belonging to Leeds which occurred at Manston temporary hospital.† The largest numbers were recorded in the first and third quarters of the year. The deaths were equivalent to an annual rate per 1,000 persons living of 22·3, or including Manston, 22·4, as against 19·8 the preceding year, 22·9 in 1892, and 22·7 in 1890.

In England and Wales the corresponding death-rate was 19·2, slightly in excess of that of the preceding year, but like our own, lower than the rate for 1891 and 1890. In the thirty-three great English towns now reported upon weekly by the Registrar-General, the rate for 1893 was 21·6, against 20·7 in 1892, 22·2 in 1891, and 22·4 in 1890. From a table to be presently given, showing the mortality in the nine great towns of the United Kingdom, including Edinburgh, Dublin, and Glasgow, all of them with a population exceeding 250,000, we shall see that we hold, and have for several years back held, the position of fourth in the list.‡ Before, however, presenting you with that table, allow me first to draw your attention to certain groups of death causes, and to compare our mortality in 1893 with that of the preceding eight years.

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* These rates are calculated upon a year consisting of 52·17747 weeks, a correction for 52 weeks being made in each case. Death-rates for any smaller or larger number of weeks throughout the report are calculated as annual rates on a year of the same length.

† See page 4. ‡ Table 2, page 8.

MORTALITY FROM CERTAIN GROUPS OF DEATH CAUSES IN 1893 AND SOME PRECEDING YEARS.

As already said, the death-rate from all causes amounted to 22·3 per 1,000 of the population. The actual number of deaths registered as having occurred in the city was 8,488, equivalent to a death-rate of 22·3 (or more accurately 22·29). Adding, however, 24 deaths which occurred at Manston, we have 8,512, corresponding to a death-rate of 22·4 (or more accurately to 22·35). Calculating our death-rate, however, upon the 8,493 deaths for which the Registrar-General has given us credit, and which include some, but not all of the deaths at Manston, the rate of mortality was 22·30.

TABLE 1.

Annual Deaths per 1,000 of the estimated population.

	All Causes.	Seven Zymotics.	Consumption.	Bronchitis, Pneumonia, Pleurisy.	Other Lung Diseases.
Five years, 1885-9 ... 261 weeks	21·16	2·78	1·70	3·93	0·27
Years 1890-91-92 ... 157 weeks	21·79	2·33	1·62	4·90	0·30*
Year 1893 ... ... Including deaths at Manston	22·35	3·53	1·70	4·14	0·34
1893 Increase on '90-1-2	0·56	1·20	0·08	...	0·04
„ Decrease „ '90-1-2	...	...	...	0·76	...
1893 Increase on '85-9	1·19	0·75	...	0·21	0·07
„ Decrease on '85-9	...	...	...	...	...

---

* Sixty-three deaths from influenza (=rate of 0·17) were included in this column for year 1892. Influenza is not included in any of the other years, and is left out also in the average for these three. The rate in this column for 1892 should therefore have been 0·26 and not 0·43 as printed in my last annual report.

These slight discrepancies are accounted for as follows:—The estate bought for hospital purposes at Manston is outside the city boundary. Since the beginning of the fourth quarter, the Registrar-General has counted all deaths there as if they had occurred within the city. On the other hand he has deducted non-municipal paupers who have died in the Workhouses, and who are known to belong to townships outside the city. It has been our practice, however, in the table which we are now considering, in previous years to include all deaths registered as having occurred in the city, whether belonging to persons from other towns or not. On the same principle all deaths in our own hospital are included in the accompanying table, but in two tables which will be given in another part of the report (21 and 22), the whole of the deaths of persons occurring in public institutions known not to belong to the City of Leeds are relegated to a footnote.

In the meantime we deal simply with the gross results, considering that but for the accident that a portion of our hospital has been placed a few yards outside the city boundary, all these deaths would have been registered as having occurred in Leeds. It will be seen that the difference is not one which to any large extent affects the comparison. In dealing with our own mortality, we shall use death-rates calculated upon these gross results. In comparing our own with that of other towns, we shall take the Registrar-General's figures for both.

All Causes.—On referring to Table 1 it will be seen that taking the largest number of deaths which could under any circumstances be considered as belonging to Leeds, our rate was 0·56 above that of the three influenza years referred to in previous reports, and 1·19 above that of the five years which preceded them.

Seven Zymotics.—Our deaths from the seven common diseases, usually classed together as zymotic, accounted fully for the increase of our rate from all causes in that of the three year period. In the five pre-influenza years our death-rate from this group had been 2·78. In the three years 1890-2 it fell to 2·33, but in the year 1893 it rose to 3·53, or 1·20 above that of the preceding three and 0·75 above that of the five earlier years.

One of the principal causes of this increase was the already spoken of outbreak of measles in the two early quarters, an increase which raised the rate of the whole year from this disease to 0·90 per 1,000. The average for the three preceding years had been 0·39. We had therefore in 1893 an increase of 0·5 per 1,000 as compared with the three preceding years. In the five years 1885-9, the average death-rate from measles was 0·57, so that our rate in 1893 was 0·32 above that of the quinquennium 1885-9.

Another cause of our increased zymotic rate was diarrhœa. Our diarrhœa death-rate in 1893 was 1·60. In the three preceding years our death-rate from this cause for the whole year averaged 0·98, and for the five years 1885-9, 1·10. The increase in the mortality from measles and diarrhœa account thus for 1·13 of the 1·20 increase in our zymotic rate for last year over that of the preceding triennium.

The death-rate from small-pox was in excess to the extent of ·07. That from diphtheria ·09,* and from continued fever ·07, altogether ·23 in excess of the rates for the triennium. The rate for scarlet fever was below that of the triennium by 0·14, the difference 0·1 bringing the 1·13 up to 1·22, the total difference in the group of the seven diseases.

Phthisis and Diseases of Air Passages.—From consumption our death-rate in 1893 was the same as that in the quinquennium 1885-9, and 0·08 in excess of that of the triennium 1890-2. From the group of commoner lung diseases, bronchitis, pneumonia, with pleurisy, our death-rate was ·76 below that of the three influenza years, but ·21 above that of the five which preceded them. From "other lung diseases," there was a slight increase upon the rates of both the triennial and quinquennial periods.

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* The death rate from diphtheria in the five years 1885-9 was 0·05, in the three years 1890-2, 0·06, rising in 1893 to 0·13. In the corresponding periods the death-rate from croup was 0·17, 0·10, and 0·18 respectively. In both cases the rate was higher for 1893 than for the three immediately previous years, but those three years have had a lower death-rate from croup than the five which preceded them. There seems to be a growing tendency on the part of medical men to use the more definite term diphtheria, instead of the indefinite one croup. That this is so is also shown by the gradual diminution in London of deaths from croup, alongside of the increasing number from diphtheria.

Localization of the increase.—It may therefore be taken that the increase of our mortality from all causes last year, over that of the three years that preceded it, was more than accounted for by the increased number of deaths from measles and diarrhœa. The increase, however, upon the quinquennium which preceded those three years, was not fully accounted for in that way, the diseases which followed in the wake of influenza appearing to have still left their impress upon your mortality records.

COMPARATIVE MORTALITY.

Thirty-three great English towns.—Although, compared with the death-rate last year in the whole kingdom, that of Leeds looked high,* a comparison with the rate in other large towns is less unfavourable. The thirty-three great towns in England and Wales, dealt with in the weekly reports of the Registrar-General, had a birth-rate of 31·9 as against ours of 32·4, and a death-rate of 21·6 as against ours of 22·3. The difference in the latter was, therefore, 0·7, or 7 deaths in 10,000 persons living.

Six largest English cities.—But when, instead of the thirty-three large English towns we restrict our attention to those which had a population at the last census of not less than a quarter of a million, the result is still more favourable to Leeds. We stand third in the list of such towns.

These six English towns were London, Birmingham, Liverpool, Manchester, Sheffield, in addition to ourselves. Together, they had a population estimated to the middle of 1893 of 6,536,429. The deaths registered during the fifty-two weeks were 144,870, or at an annual rate of 22·2 per 1,000 living. Our rate, therefore, although we ranked third, that is after London and Birmingham, was slightly in excess of the death-rate for the six, calculated upon the population of the whole of these towns.†

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* See page 3.

† The "average" of the six death-rates for these great towns was 23·5, rather above that of Leeds, the "average" of the rates of the five towns (excluding Leeds) 23·7, also slightly above our own death-rate.

Five large provincial towns.—This population of six-and-a-half millions, however, included upwards of four millions in London alone; it is therefore interesting to compare our position with that of the other large provincial English towns. The position we thus take is that of second, and our death-rate is then considerably below that of these five provincial towns, including ourselves. Our rate, as has been said, was 22·3, that of Birmingham, Liverpool, Manchester, Sheffield, and Leeds

TABLE 2.

Showing the Death-rates in the Nine Largest Towns of the United Kingdom, for the 52 weeks of 1893, and each of the 13 week periods.

	First quarter of 1893.	Second quarter of 1893.	Third quarter of 1893.	Fourth quarter of 1893.	52 Weeks.
Edinburgh -	20·6	18·0	18·1	22·3	19·7
London -	22·1	19·5	20·5	23·2	21·3
Birmingham -	22·2	19·7	22·2	23·8	22·0
Leeds -	*24·3*	*20·9*	*24·0*	*20·0*	*22·3*
Sheffield -	20·8	20·6	25·0	22·8	22·3
Glasgow -	25·8	24·6	20·8	22·3	23·4
Manchester -	26·0	24·4	25·1	24·2	24·9
Dublin -	28·1	26·2	26·3	27·4	27·0
Liverpool -	25·8	27·1	28·4	28·1	27·4

together 24·0, that is 1·7 below the aggregate of the five; but if we except Leeds from these towns their rate becomes 24·35, and our death-rate of 22·30 is actually a little more than 2 per 1,000 below the rate of the four towns mentioned.

There was, therefore, only one amongst those provincial towns whose population at the last census amounted to upwards of a quarter of a million, which had a lower death-rate than Leeds. This was Birmingham, with a rate of 22·0, or 3 deaths in 10,000 less than our own. This town has now for a considerable number of years stood well to the front in point of healthiness amongst the great cities of the kingdom. Ever since the clearance that was made of the slums in the centre of the town Birmingham has exhibited a very low death-rate indeed. I hear, however, that the Town Council of Birmingham are not yet satisfied even with the very favourable position they occupy amongst the five large provincial cities, but that they are intending to deal with some of the smaller insanitary areas that yet remain.

Nine cities of the United Kingdom—We have just seen the comparatively favourable position which Leeds held as compared with the other great towns in England, and a table was promised at page 3 dealing with the nine largest towns of the United Kingdom.* This table (table 2) gives the death-rate in each of these towns for each quarter of the year 1893, as published by the Registrar-General in his quarterly returns.

It will be noticed that in the earliest quarter of the year Edinburgh and Sheffield, with rates of 20·6 and 20·8 respectively, held the most favourable position; that London and Birmingham, with rates of 22·1 and 22·2 came next; while we take the fifth place with a rate of 24·3. This unfavourable position of Leeds was largely owing, as already stated, to our high mortality from measles and those lung diseases which so frequently accompany it.

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* This comparison is made from the Registrar-General's returns, whose figures are accepted for the purposes of comparison. The relative positions of Leeds and Sheffield are so close (Leeds 22·30, Sheffield 22·32), that their relative positions would be reversed if the figures used for the last table, instead of those given by the Registrar-General were adopted. It is better to accept the Registrar-General's figures in comparing ourselves with other towns, as his methods are similar for all.

In the second quarter Edinburgh took again the first place, with a death-rate of 18·0, London and Birmingham followed with 19·5 and 19·7, Sheffield and Leeds with 20·6 and 20·9. Our position was again fifth, but very much more favourable than that of Manchester, Glasgow, Dublin, and Liverpool. This was notwithstanding the continuance of the measles outbreak. The deaths from this disease were actually more than in the preceding quarter. On the other hand, those from bronchitis and pneumonia—common results of measles—were only about two-thirds as numerous, and the rate generally from the less common diseases had decreased considerably.

In the third quarter Edinburgh continued in the front at 18·1, London rose to 20·5, Glasgow fell to 20·8, Birmingham rose to 22·2, the rate it had in the first quarter of the year, and Leeds to 24·0, only slightly below that of the first quarter. Our position was again fifth in the list, Sheffield and Manchester following us at 25·0 and 25·1, Dublin and Liverpool 26·3 and 28·4. The chief cause of our increased death-rate in the third quarter was, as we have already seen, diarrhœa. Our death-rate from that group only was 5·20.

In the fourth quarter our rate fell to 20·0, and we held the most favourable position of any of the nine great towns. Edinburgh, Glasgow, and Sheffield followed us with rates of 22·3, 22·3, and 22·8, then Birmingham 23·9, Manchester, Dublin, and Liverpool bringing up the rear with rates of 24·2, 27·4, and 28·1.

Going back for a period of seven years Edinburgh four times held the first place, with an average death-rate of 19·5; London twice, with an average rate of 20·3; Birmingham came third, with an average rate of 20·8; Leeds fourth, with 21·6; Sheffield fifth, with 22·4. Glasgow had an average rate for the seven years of 23·8, Liverpool 25·5, Manchester 26·5, and Dublin 27·3.

STANDARD AND CORRECTED DEATH-RATES.

Correction for Age and Sex.—In the annual report for 1892 the standard and corrected death-rates as given by the Registrar-General were fully gone into and explained. The corrected death-rates, it will be remembered, are obtained by multiplying the recorded rates by a factor obtained by the Registrar-General in the manner described.* These factors are not published for Edinburgh, Glasgow, and Dublin ; but for the five large English cities dealt with on a previous page, the corrected death-rates for 1893 come out as follows:—London, 24·7 ; Birmingham, 25·5 ; Leeds, 25·7 ; Sheffield, 27·2 ; Manchester, 35·3 ; Liverpool, 39·4. These death-rates therefore represent what might be considered as the mortality in these towns if the proportion of persons living in them of the two sexes and at the ten age groups, used in his calculation by the Registrar-General, had been the same as in the country at large.

In the report for 1892 reference was made to the circumstance that the manufactures of a town like Leeds "while they bring into our midst large numbers of able-bodied persons, persons whose ages would pre-suppose a low death-rate, are also themselves circumstances which tend to the congregation of large numbers of people into crowded neighbourhoods. . . . There is also the fact that the occupiers of these dwellings live and work much more indoors than do the dwellers in the country. Not merely is the work itself more or less detrimental to the workers from the fact that it is done indoors rather than outside, but in some occupations, to the disadvantages of close air are added the deleterious effects of dangerous dust."† An attempt has accordingly been made since the publication, last Autumn, of the third volume of the Census Return, to ascertain if possible, at least in regard to Leeds, what correction should be made on account of trade.

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* Annual Report, 1892, page 8.

† Annual Report, 1892, page 11.

Correction for Trades.—In the decennial report of the Registrar-General for the years 1871-81, Dr. Ogle made an attempt to ascertain the comparative mortality from certain trades. Selecting a hundred tolerably well defined occupations, he had the deaths which occurred amongst men between the ages of 25 and 65 engaged in those trades got out, and he compared them with the numbers living at these ages and engaged in these occupations in the whole country. Taking the death-rate so found amongst the whole male population between 25 and 65 as 1,000, he found that amongst the men of the same age engaged in every kind of occupation to be 967, whilst that of "unoccupied males," including, of course, men invalided by chronic disease, and those too weak to have ever been engaged in any active occupation, to be 2,182. On the other hand, selecting only the male inhabitants at these ages of certain healthy districts, he placed their mortality figure at 804. The corresponding figure amongst "occupied males" at the same ages in the hundred selected occupations varied from 556, the mortality figure corresponding to the occupation of "clergyman, priest, minister," to 2,205 the mortality figure for inn and hotel servants.

It will be at once evident that a town which contains a very much greater proportion of clergy, and a very much smaller proportion of inn servants than the country at large might (everything else being equal) be expected to have a lower mortality than one containing a very small number of clergymen, and a very large number of hotel servants. Any inference, however, drawn from such a circumstance might be untrue unless it took into account the relative proportion of the clergy and the inn servants in relation to that of the country as a whole, and also the comparative mortality figures for these two classes of persons.

A numerical example of the method adopted will serve as an explanation. Taking first the occupations just mentioned, in Leeds, according to the census of 1891, we had 0·898 ministers of religion (excluding church officers) for every 1,000 of the population. In England and Wales there were 1·446 per 1,000.

We had therefore 0·548 per 1,000 fewer members of this longlived profession in Leeds than in the country at large. Assuming that the factor 556, given by Dr. Ogle as the comparative mortality figure for this profession at the ages of 25 to 65, held good through life, the recorded death-rate in Leeds would evidently have been actually higher than it ought to have been on account of the difference in the number of followers of this healthy occupation. Working this out it will be found that the death-rate of Leeds should be multiplied by the factor 0·9997567, to allow for this difference of clergy in our midst. This, of course, is without making any allowance for the probable circumstance that the death-rate amongst the clergy remaining might be less favourable from the greater amount of work they had to do on account of the increased number of their parishioners.

Again, there were in Leeds 553 men (or boys over 10) employed as inn servants, and 46,364 in England and Wales. These numbers correspond to 1·505 and 1·599 respectively per 1,000 of the total population, a deficit in Leeds of 0·094 per 1,000. As Dr. Ogle's comparative mortality figure was 2,205, Leeds gained slightly by having somewhat fewer persons engaged in this unhealthy occupation, and the observed death-rate requires to be multiplied by 1·0001145. The result from these two occupations is therefore that for the clergy and innkeepers' servants alone, our recorded death-rate should be multiplied by 0·99987, which practically leaves the death-rate as it stands.

It will be at once seen that a difficulty arises if we neglect taking into account the women who are acting in the capacity of inn servants. In Leeds these numbered 473, nearly as many as the men, for whom we have allowed, and when we compare the number of female inn servants in Leeds with those in England and Wales, we find that we have in Leeds 0·241 less per 1,000 of the whole population so occupied. Then comes the question, "Are we to add the minus quantity 0·241 to the minus quantity 0·094 already dealt with, or are we to neglect it?" If we neglect it, we evidently, in this particular trade, do not make full allowance for the absence of persons engaged in an unhealthy industry.

On the other hand, as it is well known that one of the principal causes of the high death-rate amongst inn servants is intemperance, is it fair to assume that the high death-rate would hold to the same extent amongst women as amongst men? If we neglect the women the factor remains for the hotel servant as already given (1·0001). If, however, we regard women as equally exposed to the risks of the trade with men, the recorded death-rate in Leeds would require for this trade alone to be multiplied by 1·0004.

But this question of the employment of women becomes important, if we take one of the principal industries of Leeds, that of the manufacture of woollen and worsted fabrics. At the time of the census, there were 6,081 male and 8,925 female persons engaged in the manufacture of woollen, worsted, and stuff, excluding wool staplers, dyers and printers of wool and woollen fabrics, flannel and blanket manufacturers, fullers and dealers in wool and worsted goods. In England and Wales there were 102,050 male and 130,954 female persons engaged in the corresponding occupations, or nearly 41 per 1,000 of the population in Leeds, and about 8 per 1,000 in the whole country. Leeds had, therefore, an excess of 32·786 persons per 1,000 of the population engaged in this industry. In this case there seems no special reason for excluding the women, as there is nothing in the nature of the work very obviously rendering them either more or less prone to death than those of the other sex. Dr. Ogle's comparative mortality factor for woollen workers was 1032, we therefore calculate on account of the prevalence of this industry (the mortality in which, amongst men between 25 and 65, was in excess of the mortality amongst all men of the same ages in the proportion of 1032 to 1000) that allowing a similar mortality amongst women similarly employed, a correction should be made of our death-rate upon this single account equivalent to multiplying it by 0·9989836.*

In a similar way the several trades for which comparative mortality figures are given by Dr. Ogle, have been got out. Where he has himself done so, however, such trades as the eleven classes of shopkeepers, or the various metal workers have been grouped together. Women workers have been included in such industries as the woollen, where they form an important part of those employed in the trade, but excluded from trades where it is evident from the statistics that the women are simply connected with the business carried on in the capacity of employer. Multiplying these factors into one another we get a general provisional trade factor of 0·986.

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* Including those of both sexes employed in the manufacture of flannels and blankets the correction factor becomes 0·9989727.

This factor, however, deals with only a portion of the population of Leeds. It takes into account 53 per cent. of the occupied males over 10, and 35 per cent. of the occupied women. Taking the two sexes together, the factor takes account of 66 per cent. of the total occupied population over 10, or together 31 per cent. of the total population. What, if anything, to allow for the remaining third of the occupied persons belonging to trades for which no factor is obtainable, it is difficult to say. This 34 per cent. of occupied persons not dealt with may belong to healthier or unhealthier trades. They are to some extent allowed for, in so far as they are remainders. That is to say, for instance, in Leeds in every 1,000 of our population we had 1·68 agricultural labourers. In England and Wales the number was 24·46. Every 1,000 of our Leeds population, therefore, contains 22·78 fewer agricultural labourers than the average proportion in the country. These 22·8 must have been made up by persons otherwise occupied, and some of them belong to the 34 per cent. of occupied persons not dealt with in our calculation. Amongst unoccupied males between the ages of 25 and 65 in the whole of England and Wales, the mortality, as has been already said, was found by Dr. Ogle to be more than double that of the whole male population at the same ages. In Leeds 11 per cent. of the whole male population belonged to this class. In England and Wales 12 per cent. We had therefore in Leeds a very much smaller number in proportion of this class with a high death factor. Similarly, amongst women, the unoccupied female population over 10 in Leeds was 47 per cent. of the whole female population in the city. In England and Wales it was 50 per cent. While, however, the unoccupied male population has a death factor higher than that of the whole population, this is probably due, as already pointed out, to the inclusion in this class of a large number of invalid lives. But though the halt and the maimed are possibly fewer in a manufacturing town, to a very large extent it seems probable that the smaller percentage of unoccupied persons is rather due to the exodus of the leisured class, so many of whom go away from our smoky atmosphere to brighter skies, and whose absence would increase our recorded death-rate.

TABLE 3.

Showing the births and deaths registered in the City of Leeds in the four periods of thirteen weeks ended April 1st, July 1st, September 30th, and December 30th, 1893; showing also the deaths registered in the same periods at certain groups of ages.

		Mortality from all Causes at Subjoined Ages.						
1	2	3	4	5	6	7	8	9
1893. Estimated population at these ages.	Regis-tered Births.	At all Ages.	Under 1 Year.	1 and under 5.	5 and under 15.	15 and under 25.	25 and under. 60.	60 and upwards.
		382,094	10,850	36,968	85,171	78,585	149,846	20,674
I. Quarter	3,145	2,312	551	422	96	100	615	528
II. Quarter	3,235	2,005	543	451	81	103	483	344
III. Quarter	3,071	2,288	953	321	80	106	465	363
IV. Quarter	2,897	1,907	495	289	83	102	486	452
52 weeks. . .	12,348	8,512	2,542	1,483	340	411	2,049	1,687

Here, again, is yet another difficulty. While unoccupied men have a specially high mortality, it does not follow that the same is true of women. The census enumerator has probably been unchivalrous enough to return many women engaged in household occupations, otherwise than as domestic servants, as "unoccupied," forgetting that while "a man his work is from sun to sun, but a woman, her work it never is done." These "unoccupied" women would of course include the infirm, but they would include also a very large proportion of the most longlived members of the community.

To make the comparison complete, I should have wished, had time permitted, to obtain similar factors for at least the other five great towns. Should I be able to do so before the report is finally printed, I may append such information either as a footnote or a table at the end. One thing, however, will strike everyone, and that is that the factor, 1·152 (the correction according to age and sex adopted by the Registrar-General), multiplied by the factor 0·986, obtained as above, still leaves a factor of 1·136, by which the death-rate has got to be multiplied. If we are to suppose that a corresponding correction must be made for trades for which we had no comparative mortality figure, the age and sex correction factor might have to be still further altered.

BIRTH-RATE.

In the two tables which follow will be found, in addition to the deaths and death-rates at certain periods, certain figures relating to the number of births in Leeds in each quarter of 1893, and their relation to the population of the city.

It will be noticed that our birth-rate dropped towards the end of the year to 30·4 per 1,000. The number of births in the fourth quarter of 1893 was actually less than in any quarter of that year or any of the three preceding ones.

Births in 1890-2.—In the fourth quarter of 1889, the first period on which I made you a report, the number of births (2,861) was actually below that just mentioned, but as the estimated population was also at that time smaller the proportionate rate was higher (32·2). From 32·2, in the fourth quarter of 1889, the birth-rate rose to 33·9 in the first quarter of

1890, remaining at about 34 during the three earlier quarters of the year. In the fourth it dropped below 32, but rose in the first quarter of 1891 above 34, reached 36 in the second quarter, falling to 33 in the third and fourth quarters of that year. After again falling to 31 in the first quarter of the following year (1892) the birth-rate averaged 35 in the second and third quarters, falling below 33 in the last quarter.

Birth-rate in 1893.—The rate stood at 33 in the first quarter of 1893, rose to 34 in the second, and fell steadily to 32 and 30 in the third and fourth. A continued fall in the birth-rate is often an indication that a movement of the population has taken place. The drop has scarcely been sufficient at the present time by itself to warrant that inference, especially as the rate has shown signs of rising in the earlier part of the present year (1894).

TABLE 4.

Showing the rates per 1,000 on the estimated population of 382,094 of the births and deaths at all ages, and the mortality per 1,000 living at the several groups of ages.

		DEATH-RATES.						
1 1893.	2 Birth-rate.	3 At all Ages.	4 Under 1 year. *	5 1 and under 5.	6 5 and under 15.	7 15 and under 25.	8 25 and under 60.	9 90 and upwds.
I. Quarter	33·0	24·3	204	45·8	4·5	5·1	16·5	102·5
II. Quarter	34·0	21·0	201	49·0	3·8	5·3	12·9	66·8
III. Quarter	32·3	24·1	353	34·8	3·8	5·4	12·5	70·5
IV. Quarter	30·4	20·0	183	31·4	3·9	5·2	13·0	87·8
52 weeks . .	32·4	22·35	235	40·2	4·0	5·2	13·7	81·9

* See also table 5.

AGE MORTALITY.

The increase in the mortality of the town as a whole, as compared with recent years, did not obtain equally at all ages, but, as will be seen from tables 3 and 4, was chiefly due to deaths which occurred in children below the age of 5. This is corroborative proof that the apparent increase in our death-rate was due to temporary causes.

In three of the four groups above the age of 5 our death-rate showed no increase upon the rate of the preceding triennium. In the remaining age period—that between 15 and 25—the increase, which was merely nominal, was due to the exceptionally low death-rate at that age in 1892.

The mortality, at all ages, it will be noticed, was greatest during the first and third quarters, the death-rate having fallen to 20 in the last quarter of the year. It will be also noticed that this fall was particularly emphasised in the deaths of very young children.

It is perhaps desirable to explain how the rates at the several age groups in table 4 have been calculated. The birth-rate and the death-rate at all ages are estimated in the usual manner* for periods of thirteen and fifty-two weeks upon a population estimated by the Registrar-General by geometrical progression to the middle of 1893. The number of persons living at an age group, say, for instance, between 15 and 25, at the time the census was taken was ascertained, and by this number the total population of Leeds at the last census was divided; the resulting number (in this case 4·86) was used as a factor, by which the death-rate obtained upon the whole population from the deaths at the particular group of ages (amounting in the case supposed to 411) was multiplied, the result, in the instance given, being the death-rate in the table of 5·2.* In the same way the other age death-rates are obtained, each by the use of its appropriate factor.

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* Thus: Number of births or deaths, in thirteen weeks, multiplied by $\frac{52{\cdot}17747 \times 1000}{\text{whole population} \times 13}$ or, in 52 weeks, by $\frac{52{\cdot}17747 \times 1000}{\text{whole population} \times 52}$.

In previous years this factor was obtained from the results of the census of 1881, the full details of the 1891 census not having been published until the close of 1893. Consequently the death-rates in previous reports are not strictly comparable with those in table 4. As it is probable that the populations at various ages in 1890 would correspond more nearly to those ascertained in 1891, than the rather ancient history census of 1881, it has been thought better to recalculate the age death-rates for 1890, 1891, and 1892 upon the data of the recent census, and these corrected figures are given for these three years along with the corresponding figures for 1893 in table 4a.

TABLE 4a.

		DEATH-RATES.						
1	2 Birth-rate.	3 At all ages.	4 Under 1 Year. †	5 1 and under 5	6 5 and under 15	7 15 and under 25.	8 25 and under 60.	9 60 and upwds.
1890. (53 weeks.)	33·5	22·7	203	33·9	4·5	5·3	16·5	94·6
1891. (52 weeks.)	34·1	22·9	212	39·1	4·5	5·2	15·5	91·8
1892. (52 weeks.)	33·5	19·8	199	30·0	3·7	4·3	12·9	81·9
1893. (52 weeks.)	32·4	22·4	235	40·2	4·0	5·2	13·7	81·9

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* Thus $\left\{411 \times \frac{52{\cdot}17747}{52 \times 382{,}094}\right\} 4{\cdot}86 = 5{\cdot}2.$ The rates may also be calculated from the estimated population given in table 3 in the manner described in the preceding foot-note.

† See also table 5.

Age Mortality in quarters of 1893.—The death-rate calculated upon the estimated population of children under 1, estimated in the way just described for 1893, was highest in the third quarter of the year. The first and second quarters stood nearly on a level, but in both the deaths at this age were considerably above the average of recent years. At the next age period, that between the ages of 1 and 5, the highest mortality occurred in the second quarter; the next highest having been in the first. This first quarter had the highest death-rate at three other periods of age, viz., 5 to 15, 25 to 60, and 60 and over. (See table 4, page 18.)

Comparative age mortality in 1893 and three preceding years. From table 4a it will be noticed that our death-rate in children under 1, calculated in the manner described, has been some 14 per cent. above the rate which prevailed in the three preceding years. At the next group of deaths, those over 1 and under 5, there was also a higher mortality, and again of about 14 per cent. above that of the three preceding years. At the next age group, that of children between 5 and 15 (the school-goers), the death-rate last year was lower than in either 1890 or 1891, though a little higher than in 1892, a year which had an exceedingly low death-rate. The same remark applies, though not quite to the same extent, to the period between 15 and 25—the age of adolescence. At this group the death-rate was a little below that of 1890, the same as that of 1891, and about 2 per cent. above the low rate of 1892. At the next age period—25 to 60—which includes those in the prime of life, the death-rate last year was considerably below that of 1890; it was also considerably below that of 1891, but again (this time to the extent of 6 per cent.) above that of 1892. In the last age period, that of persons over 60, the death-rate was lower than in the years 1890 and 1891, and the same as that of 1892.

Alteration of Age Groups in Table A.—The age groups dealt with in tables 3 and 4 are those which were adopted some years ago by the Local Government Board in table A required by them from all sanitary authorities. In that table for the year we are considering, and which will be found in the appendix, we have retained the old grouping as far as the age of 60. Deaths between the ages of 60 and 65 have been inserted in a separate and new column. The last age group thus becomes that from 65 and upwards, instead of from 60 upwards. This alteration is adopted on account of the change made last year in the schedule sent out by the Board. The schedule makes the two final columns (those, namely, corresponding to columns 8 and 9 in tables 3 and 4) apply to deaths grouped at ages from 25 to 65, and 65 and upwards, instead of 25 to 60, and 60 and upwards as formerly. It was not received by us in time to make the necessary alterations in the report for 1892. It has been thought better in table A, in the appendix to the present report, to give separate columns to the deaths between the two dividing lines of 60 and 65, so that the numbers can be obtained for either the old or the new grouping, by adding the intervening column to the one upon either side of it. In the tables in the text, however, the old grouping has been retained.

The number of deaths in the several quarters between the ages of 60 and 65 were 115, 91, 92, and 100; the total for the 52 weeks, 398. Adding these numbers to the figures in column 8, table 3, we get the deaths between 25 and 65. The number of persons estimated as living between these ages at the middle of 1893 was 158,631, and the deaths are equivalent for the successive quarters to an annual rate of 18·5, 14·5, 14·1, and 14·8 per 1,000 respectively, and to a rate of 15·4 for the year. Deducting the numbers just given from those in column 9, we get a death-rate at 65 years and upwards upon a population at that period of life estimated at 11,889, for the four quarters as follows:—139·4, 85·4, 91·5, and 119·, and for the 52 weeks 108·. It will be noticed that these numbers are considerably higher than those given in column 9 either in table 4 or in table 4a; the death-rate between 60 and 65 being considerably lower than the one above the latter age. As the numbers have been got out between the ages of 60 and 65, it may be interesting to give the death-rate estimated upon those living during those five years, for the successive quarters. Persons between the ages of 60 and 65 died at an estimated annual rate of 52·5, 41·6, 42·0, and 45·7 in the several quarters, and during the whole year at the rate of 45·5. It is interesting to compare these rates during these five years with the death-rate of children under the age of five, which was 84·4.

Infants under one.—As in previous years, I propose to refer specially to the deaths at the earliest of the several age periods dealt with. The method described of estimating the death-rate upon a population computed upon two assumptions—one, that the total population has increased at a geometrical ratio, the other, that the proportion of persons at the several ages remains as in 1891—may easily lead to results which are fallacious. This is the case more especially when we come to consider the mortality of very early life. The number of persons living, say from 25 to 60, will be affected considerably by the migrations of the population. To a certain, but a very much less extent, the number living at early ages will also be affected by the migration of their parents ; but the number of children under 1 year of age who might happen to be alive on the fifth day of April, 1891, was dependent to some extent upon the accident of the particular day upon which they were born. Those born on the fourth would be counted, those born on the sixth would not. Those born before twelve o'clock on the Sunday would be counted, those born after twelve on Monday morning would not. In the same way the accident as to which of the large number of deaths occurring at this tender age happened before or after midnight on the Sunday, would affect the population enumerated at this age.

This accidental number of children under 1, so enumerated upon a particular day has, however, to furnish the chief datum for the calculation of the population at that age two years later, under varying conditions of birth and death-rate. It is, however, desirable to employ the rate so calculated as a means of correcting the more convenient rate obtained from the relationship of deaths under one to births. In table 5, in the first line, the

TABLE 5.

Mortality in Children under one year of age, during the 52 weeks of 1893.

	First Quarter.	Second Quarter.	Third Quarter.	Fourth Quarter.	YEAR.
Calculated per 1,000 of the population under 1, estimated to the middle of 1893 on the supposition that the whole population of the city had increased at G.P. at the rate of 1·745 per cent. per annum, which was the rate of increase between 1881 and 1891, and that children at this age bear the same proportion to the whole population as in 1891 ...	204	201	353	183	235
Deaths under 1 per 1,000 births registered in same period	175	167	310	171	206
Deaths per 1,000 registered births averaged during the same period, and the four similar quarterly periods preceding it. The rate for the year is the average of the four quarterly rates...	175	169	303	160	202
Same for three preceding years	156	159	213	168	174

figures are the same as those given in the fourth column of table 4, and are computed from the population so estimated. If we compare the line in this table with the similar lines in those for the previous three years, after making the necessary corrections from the results of the recent census, we shall find that in the first quarter our death-rate was 204, against an average for the first quarter of the three preceding years of 183. In the second quarter our death-rate was 200 per 1,000, against an average in the second quarter of the three preceding years of 188. The third quarter has always a high death-rate at this age, and averaged in the three years 1890-2, 251. It was 50 per cent. above its average last year, when it stood at 353. The fourth quarter had a rate last year of 183, against an average of 198, the only quarter in which our rate fell below that of the triennium. The whole year had an average of 235 against 205 in the triennium.

The second line in table 5 gives the rates of infantile mortality upon the basis usually employed, viz.:—the number of births which have occurred during the same period. The death-rate against each quarter represents the number of deaths under one in that quarter multiplied by 1,000, and divided by the number of births registered in the same period.

Reasons have been given in previous reports for preferring the method used for the third line in which for each quarter the number divided by instead of being the births in the same period, is the average number of births occurring in five similar but consecutive periods. The yearly rate is the average one of the quarters. Compared with the corresponding line of the similar table for the three preceding years, the results are as follows:—the first quarter had the mortality figure of 175 per 1,000 births, as against 156 in the triennium. The second quarter, 169, as against 159. The third quarter of 303, against 213; while the the fourth quarter, as before, had a lower rate, 160, as against 168, the whole year having a rate of 202, as against 174. The rate, as it will be remembered, upon the computed population, was 235, against 205. By the former method of calculation (that of death-rates per 1,000 living) our increase upon the whole year was 14 per cent., by the latter method, dealing with deaths registered to average births, it was 16.

PART II.—SPECIAL DISEASES.

This part of the report will contain, as did that for last year, information in regard to special causes, or in regard to special groups of causes, somewhat more in detail than in Part I.

In regard to several of these groups, tables will be found giving the conditions met with in the houses visited on account of illness or death from these causes. It has been thought desirable to go somewhat fully into the subject of diarrhœa, which played so important a part in the increased mortality from all causes in 1893. Small-pox also having been unusually prevalent, though fortunately not very fatal during the year, calls for some special treatment. At the close of this part will be found two tables dealing chiefly with the groups of diseases included in Table A, required by the Local Government Board, with some extensions in regard to certain of these groups.

While in this part of the report special features as to mortality in any particular district are noted, and while the details as to house conditions, age, and sex of cases investigated are given for each of the registration districts, most of the information refers to the town as a whole. The mortality from special diseases in particular districts of the town will be found more fully treated in Part III., under which head (the health of districts) tables are given showing the actual death-rates and the proportionate mortality in each registration district from the commoner infective and respiratory diseases, as well as generally from all causes. There is also a table (25) which it has been found more convenient to place in the third part of the report, giving a comparative view of certain house conditions found on investigation of some special diseases.

Tuberculosis.

Table 6, like the corresponding table in my last report, gives information as to the deaths registered from scrofula and tuberculosis during the fifty-two weeks of 1893. It is probable that the figures do not deal with all the deaths due to this infectious disease. Many deaths registered as due to meningitis, and which are classified under nervous diseases, might probably have been more correctly returned as due to a tuberculous affection. It is also probable that some of the deaths registered as from " wasting," might more correctly have been regarded as due to tuberculosis. On the other hand it is possible that some of the deaths certified from hydrocephalus might not have been due to tubercle. While it is, therefore, likely that most of the 961 deaths registered from these affections were really due to tubercle, it is quite possible that the number includes a larger proportion of deaths than would have been included under the same headings say twenty years ago. During these twenty years great attention has been paid to tuberculous disorders, and it is probable that many illnesses which would formerly have been certified in a vaguer manner are now classed under this head.

The heading "general tuberculosis" in former reports has been altered to "tuberculosis, general and undefined." The majority of the cases under this heading, both in this and previous reports, are not recorded as due to general tuberculosis, and the column includes deaths from localised tuberculosis of the forms not found in other columns. Many of the deaths recorded are simply registered as " tuberculosis."

In my last report it was my duty to inform you that the death-rate from this group showed an improvement of 18 per cent. on that of 1891, and 14 per cent. on that of 1890. In 1892 our deaths from this group were 809, and our rate of mortality 2·16 per thousand of the population. In 1891 the deaths were 967, a little in excess of the year we are considering, and the mortality 2·63, while in 1890 the deaths were 928 and the mortality 2·51. It will be seen, therefore, that our mortality last year was practically the same as that for 1890, while it was 4 per cent. lower than that for 1891, and 17 per cent. higher than the low rate for 1892. While in 1892 the actual deaths (excluding those from scrofula) were fewer, the percentage on the whole mortality was greater ; other diseases having decreased to a much greater extent than those of the tuberculous type. Excluding the deaths from scrofula we had 949 deaths last year ascribed to tuberculosis. The total deaths from all causes were 8,512, so that our mortality from this group was 11 per cent. of the deaths from all causes; this is the same percentage as (also excluding scrofula) obtained in 1890 and 1891. In 1892 tuberculosis formed 18 per cent. of all deaths. Upon the whole, therefore, tuberculosis, notwithstanding a greater accuracy of registration, has not shown any sign of increase, but rather the reverse.

TABLE 6.

Mortality from Tuberculosis, 1893.

1893.	Tuberculosis, general and undefined.	Phthisis.	Hydro-cephalous.	Tuberculous Meningitis.	Tuberculous Peritonitis.	Tabes Mesenterica.	Scrofula.	TOTAL.
I. Quarter ...	21	180	3	12	7	19	5	247
II. do. ...	26	162	5	26	13	13	3	248
III. do. ...	36	163	7	11	8	43	4	272
IV. do. ...	16	143	2	18	4	11	...	194
Year (52 weeks)..	99	648	17	67	32	86	12	961
Annual death rate, 52 weeks, 1893 ...	0·26	1·70	0·04	0·18	0·08	0·23	0·03	2·52

The principal constituent of this group has been already considered in dealing with table 1. We saw that in the five year group, 1885-9, the mortality from consumption was 1·70, that in the three influenza years it was 1·62, and in the year we are considering 1·70. It will be seen from table 6 that the mortality was highest in the first quarter, was much lower, though nearly the same in the second and third quarters, and fell very considerably in the fourth quarter of the year. In 1892, while the mortality had been highest in the first quarter, it was lowest in the third.

Diseases chiefly affecting the lungs and air-passages.

On referring to table 1[*] it will be seen that this group, which includes consumption, bronchitis, pneumonia, pleurisy, and other lung diseases caused a death-rate of 6·18 per thousand of the estimated population in 1893 against 6·81 in 1890-92, and 5·90 in the five pre-influenza years. These rates exclude deaths certified as primarily due to influenza. It would seem, however, that the influenza factor largely influenced the rates. Regarded in relation to deaths from all causes this lung group has to be credited with 27·7 per cent. of all deaths during 1893, with 31·3 per cent. in the three influenza years, and 27·9 in the five years which preceded them. Notwithstanding, therefore, the high mortality from measles last year our percentage of lung diseases to total mortality was considerably less than in the three influenza years, and slightly less than in the pre-influenza period. It has, however, to be remembered that diarrhœa figured largely last year in our death returns.

Consumption has been already dealt with under the heading of tuberculosis ;[†] it is not therefore necessary to say much more about it. It accounted for 1·70 of the 6·18 deaths per thousand of the population from lung troubles and 1·70 of the 2·52 deaths per thousand from tuberculous disease.

BRONCHITIS, PNEUMONIA, AND PLEURISY.

These three diseases form the greater part of the group. Out of a death-rate of 6·18 from all lung diseases (exclusive of influenza) we have seen that 1·70 was due to consumption,[‡] and of the remainder 4·14 was due to these three diseases, and 0·34 to other lung complaints. In the three years which preceded, 4·90 out of a total of 6·81 were due to these three diseases, and in the five pre-influenza years 3·93 out of a total of 5·90.

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[*] Page 4. [†] See also p. 6. [‡] Table 1, p. 4.

Still further dividing this group it will be found, on reference to table C, that out of the 4·14 deaths per thousand of the population due to this group of three diseases, bronchitis contributed 2·50, broncho-pneumonia 0·62, pneumonia 0·90, pleuro-pneumonia 0·05, and pleurisy 0·08. The group, therefore, in which pneumonia figures (broncho-pneumonia, pneumonia, and pleuro-pneumonia) accounted for 1·57 of the 4·14 or 38 per cent. of the deaths from the group. If we add pleurisy we thus account for nearly 40 per cent. of the group. The remaining 60 per cent. was due to bronchitis. It is probable, however—and this matter was dealt with somewhat at length in my report for 1892—that the greater part of the 0·62 deaths per thousand of the population attributed to "broncho-pneumonia," and possibly a considerable portion of the 0·90 attributed to "pneumonia," would belong to the bronchitic group; that is to say, would be due to diseases originating in the lining membranes of the bronchial tubes rather than to those commencing in the air vesicles themselves.

Time incidence.—On referring to table 18 it will be seen that while the group averaged 4·14 for the year the death-rate was highest in the first quarter. The rate in that quarter was 6·08. The third quarter had the lowest rate, 2·28. The second quarter had a rate of 4·08, and the fourth of 4·14, both being practically the same as the rate for the year. In the previous year (1892), while the average for the whole year was practically the same (4·13), the rate in the first quarter, though the highest of the four, was less, viz., 5·27. That for the third quarter (2·06), while the lowest of the four, was also less than the rate for the corresponding quarter in 1893. The second and fourth quarters in 1892, but the former especially, had rates above the average for either of the years. It is therefore chiefly in the early part of the year that this group of diseases was especially fatal.

Time and age incidence of bronchitis and broncho-pneumonia. Distributing these diseases for the various times of the year, as was done for the whole year, it will be found that in 1893 bronchitis alone, which caused a rate of 2·50 for the whole year, caused deaths at the annual rates of 4·11 in the first quarter and 1·19 in the third quarter of that year. The emphasis of the mortality from this cause was therefore especially upon the first quarter of 1893. In 1892 while the first and second, but especially the first, exceeded the rate for the year, the third fell below the year's rate, but not so low as in 1893. The peculiarity in 1893 was the high rate in the first quarter. Taking the two years together the annual rates for the eight successive quarters were as follows:—3·72, 3·09, 1·23, 2·55 for 1892, with an average of 2·65; and 4·11, 2·26, 1·19, and 2·43, with an average of 2·50 for 1893.

These rates apply only, however, to deaths from bronchitis at all ages. In 1893 the proportion of deaths from bronchitis to persons living was nearly 9·78 per thousand amongst those under five, and only 1·45 amongst those above that age. The mortality under five, in proportion to the numbers estimated as living at that age period, was 13·2 per thousand in the first, 10·3 in the second, 6·1 in the third, and 9·6 in the fourth quarter of the year. (Table 6a, page 33.)

While therefore the mortality at all ages fell from 4·11 in the first quarter to 1·19 in the third (or 71 per cent.), in the same period the fall in the mortality amongst children under five was only one of 54 per cent. This was in each case the greatest fall in the year; but while the mortality at all ages fell from 4·11 in the first to 2·26 in the second (or 45 per cent.), the mortality of children under five fell from 13·2 to 10·3, or only 24 per cent.

This is still more marked if we compare the death-rates of children under five years of age with the mortality of persons over five. The latter was 2·81 per thousand living in the first quarter and 1·10 in the second, a fall of 61 per cent., and the rate went further down to 0·49 in the third quarter, a total fall in the half-year of 82·6 per cent. It is therefore evident that the mortality from bronchitis did not show, in young children, the amount of improvement that was manifested amongst older persons as the year went on.

In broncho-pneumonia the deaths in young children were at the annual rate of 5·9 per thousand of the population in the first quarter, and fell to a rate of 3·4 (or 42 per cent.) in the second quarter, and to 3·1 in the third (oral together for the half-year 47 per cent.), rising a little again in the fourth quarter to 3·5. On the other hand the deaths amongst persons over five fell from 0·21 to 0·12, or 43 per cent., and still further to 0·4 in the third quarter (or altogether 81 per cent. in the six months), rising again in the last quarter of the year to nearly the same as in the first. In this group also the fall in the mortality of young children was more gradual than that of older persons.

Time and age incidence in "pneumonia."—The larger group of pneumonia, on the other hand, instead of falling in the second quarter actually rose in young children from 2·3 to 2·9, after which it fell 51 per cent. to 1·4 in the third quarter, rising again in the fourth quarter to 2·5. In persons above five in the pneumonia group the mortality also rose in the second quarter from 0·68 to 0·84, falling some 43 per cent. in the third quarter and rising again in the fourth.

In bronchitis, broncho-pneumonia, and to a less extent in pneumonia, the diseases which are apt to follow measles, the drop in the mortality amongst young children was less marked in the second and third quarters than it was in those who were older. The number of deaths in young children from pleurisy and pleuro-pneumonia was too small to call for comment.

PNEUMONIA.

Three hundred and forty-one deaths were registered as due to pneumonia, that is to say, these deaths were certified as due to croupous-pneumonia, lobar-pneumonia, or "pneumonia." There were also 18 deaths certified as due to pleuro-pneumonia, making in all 359. These 359 deaths do not include 237 deaths

TABLE 6a.

Shewing death-rates per 1,000 of the estimated population under and over the age of five years, for each quarter of the years 1892 and 1893, from several groups of lung affections, excluding phthisis.

	1892.										1893.									
	YEAR.		I.		II.		III.		IV.		I.		II.		III.		IV.		YEAR.	
	− 5	+ 5	− 5	+ 5	− 5	+ 5	− 5	+ 5	− 5	+ 5	− 5	+ 5	− 5	+ 5	− 5	+ 5	− 5	+ 5	− 5	+ 5
Bronchitis	9·54	1·66	10·93	2·69	13·41	1·61	4·87	0·71	8·97	1·64	13·18	2·81	10·33	1·10	6·05	0·49	9·57	1·41	9·78	1·45
Broncho-pneumonia ...	3·22	0·17	2·56	0·22	3·50	0·13	2·22	0·05	4·61	0·27	5·88	0·21	3·36	0·12	3·11	0·04	3·53	0·20	3·97	0·14
Pneumonia	2·33	0·64	2·56	0·70	2·48	0·93	1·28	0·35	2·99	0·57	2·27	0·68	2·94	0·84	1·43	0·48	2·52	0·78	2·29	0·70
Pleuro-pneumonia	0·11	0·03	0·09	0·06	0·17	0·02	0·09	0·01	0·09	0·04	...	0·08	0·08	0·06	...	0·02	...	0·04	0·02	0·05
Pleurisy	0·02	0·04	...	0·05	...	0·04	0·09	0·01	...	0·07	...	0·11	0·08	0·12	...	0·06	0·08	0·06	0·04	0·09
Other (non-tuberculous) lung diseases	0·34	0·14	0·34	0·17	0·43	0·18	0·17	0·05	0·43	0·17	0·25	0·16	0·50	0·14	0·76	0·11	0·67	0·13	0·55	0·14
	15·57	2·69	16·48	3·89	19·99	2·92	8·71	1·19	17·08	2·76	21·58	4·06	17·29	2·39	11·35	1·20	16·37	2·62	16·65	2·57

TABLE 7.

Pneumonia—Deaths and Death-houses. Fifty-two weeks ended December 30th, 1893.

REGISTRATION DISTRICT.	AGES OF CASES.						SEX.		DAYS FROM ATTACK TILL HEARD OF.	AT SCHOOL.	HOUSES		DENSITY OF POPULATION.		DRAINAGE.														CLOSETS.					
																	INSIDE.								OUTSIDE.				W.C.					
																	SINK.				OTHER.				FALL PIPE.		OTHER.		INSIDE.					
	0—1	1—5	5—15	15—25	25—60	60+	M.	F.			BACK TO BACK, &c.	THROUGH.	INMATES.	ROOMS.	DISCONNECTED.	NOT DISCONNECTED.	T.	C.	T.C	D.	T.	C.	T.C	D.	D.	C.	T.	D.	F.V.	Not F.V.	OUTSIDE.	T.W.C.	MIDDEN.	PAIL.
COLS. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
NORTH	8	9	1	4	43	5	38	32	15·8	1	55	10	413	232	18	44	43	4	14	1	2	1	1	..	44	10	6	..	..	..	12	34	19	..
WEST	7	13	5	2	19	9	33	22	23·4	2	39	14	296	219	28	24	22	1	28	1	1	..	6	..	27	11	7	..	2	1	20	12	17	1
SOUTH-EAST	5	7	..	..	15	5	19	13	14·7	1	23	9	213	113	11	18	15	..	12	2	3	..	2	..	22	8	1	1	1	1	3	16	4	7
HUNSLET	10	22	4	10	27	8	44	37	21·8	4	58	21	437	287	32	47	46	..	33	..	17	..	2	..	65	9	13	1	1	1	23	24	30	..
HOLBECK	2	3	2	1	13	3	13	11	12·9	1	14	8	109	82	9	12	10	4	5	2	2	1	1	..	19	2	6	..	..	..	5	5	12	..
WORTLEY	2	7	..	2	12	5	12	16	16·6	..	20	7	150	103	8	17	14	1	10	..	2	..	..	1	23	2	1	..	..	2	4	2	19	..
KIRKSTALL	2	1	..	2	11	6	11	11	16·6	..	9	13	118	113	12	10	7	..	15	..	3	..	9	..	22	..	2	..	2	3	7	..	10	..
BRAMLEY	2	6	..	2	5	3	12	6	16·6	..	13	5	98	81	9	8	7	1	9	..	1	..	4	..	15	2	..	..	..	..	1	..	17	..
CHAPELTOWN	1	2	1	1	4	2	7	4	15·2	..	7	4	57	67	4	7	6	..	5	..	2	2	3	..	10	..	..	..	..	2	6	..	3	..
WHITKIRK	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
TOTALS	39	70	13	24	149	46	189	152	18·3	9	238	91	1891	1297	131	187	170	11	131	6	33	4	28	1	247	44	36	2	6	10	81	93	131	8

T.—Trapped and then going directly into drain. C.—Cut off over an outside gully. T.C.—Same, plus an inside trap. D.—Directly connected with sewer
F.V.—Soil pipe continued full size above the eaves. T.W.C.—Trough water closet. See note and text.

NOTES TO PNEUMONIA TABLE.

The information in this table (except under head of density of population) refers to "death-houses," the facts about the same house being repeated for every fatal case which occurred in it.

Duration of illness.—This column gives, for each district, the average length of time from the commencement of the symptoms to the date when information of the death reached our office.

Houses.—The 238 houses in column 12 include 214 back-to-backs, 17 "salt-pies," and 7 single houses without apertures in the rear wall. Of the latter, four occurred in *Bramley*, two in *Wortley*, and one in *Hunslet* district. The salt-pies occurred three each in the *North*, *West*, and *Wortley* districts; two each in the *South-East* and *Hunslet* districts, and one each in the following:—*Holbeck*, *Kirkstall*, *Bramley*, and *Chapeltown*. The 327 houses in which the 329 cases occurred consisted of 213 "back-to-back," 17 "salt-pie," 7 single houses without apertures in the rear wall, and 90 through houses. Second fatal cases occurred in a through house in the *Hunslet*, and a back-to-back house in the *North* district.

Density of population.—The number of inmates or rooms is not recounted where a second case occurred in the same house. The figures given deal with 327 houses in which 329 deaths occurred. The two houses in which second deaths occurred had—the *Hunslet* one eight inmates and five rooms, and the *North* district one four inmates and two rooms.

Drainage disconnection.—(See also explanation page 61 and page 74, Annual Report, 1892.) Houses containing w.c., with soil-pipe not properly ventilated, are included amongst those not disconnected. One hundred and thirty-one death-houses were disconnected, 187 not disconnected, and 11 had no drain. Actual houses, 131 disconnected, 186 not disconnected, and 10 no drain. The earlier figures include the repetition of the two houses in which second deaths occurred. One of these was not disconnected, the other (*North*) had no drain.

Sink wastes.—Eleven death-houses had no sink. Of these three were in the *North* (two cases in one dwelling), one in the *West*, three in the *South-East*, one in *Holbeck*, two in *Wortley*, and one in the *Bramley* district.

Other inside drainage.—Every exit of waste water from the house to the drain, other than the sink, is included in these four columns, but many houses had no other inlet to the drain. These columns, consequently, will not balance the number of houses.

Outside drainage.—The last remark also applies to columns 28 and 29. Columns 26 and 27 (fall-pipes) will balance if eleven houses in the *North*, fifteen in the *West*, two in *South-East*, five in *Hunslet*, one in *Holbeck*, two in *Wortley*, and one each in *Bramley* and *Chapeltown* districts, which had no fall-pipe on the house itself, be added. No second fall-pipe to the same house is counted.

Closets.—Five death-houses had seven extra conveniences; one in the *North* district (a lodging-house entered T.W.C.) had three additional T.W.C.'s. In the *West* district a house (with a water closet F.V.) had also an outside water closet. In *Chapeltown* a house (entered not F.V.) had also an outside water closet, another (entered M.) had an F.V. closet inside, while in *Bramley* a house (entered M.) had also an F.V. closet within.

TABLE 7a.

Pleuro-Pneumonia—Deaths and Death-houses. Fifty-two weeks ended December 30th, 1893.

REGISTRATION DISTRICT.	AGES OF CASES.						SEX.		DAYS FROM ATTACK TILL HEARD OF.	AT SCHOOL.	HOUSES.		DENSITY OF POPULATION.		DRAINAGE.														CLOSETS.					
															DISCONNECTED.	NOT DISCONNECTED.	INSIDE.								OUTSIDE.				W.C.			T.W.C.	MIDDEN.	PAIL.
																	SINK.				OTHER.				FALL PIPE.		OTHER.		INSIDE.		OUTSIDE.			
	0–1	1–5	5–15	15–25	25–60	60 +	M.	F.			BACK TO BACK. &c.	THROUGH.	INMATES.	ROOMS.			T.	C.	T.C	D.	T.	C.	T.C	D.	D.	C.	T.	D.	F.V.	NOT F.V.				
COLS. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
NORTH	1	..	..	..	1	..	2	..	18·5	..	2	..	7	2	1	1	1	..	1	..	..	..	..	..	..	1	..	..	..	..	2	..	..	..
WEST	..	..	..	..	4	2	5	1	16·5	..	4	2	25	28	..	6	5	1	..	..	..	..	..	..	6	..	1	..	..	1	1	..	4	..
SOUTH-EAST	..	..	1	..	3	..	3	1	37·2	..	4	..	17	16	1	3	3	..	1	..	..	..	..	..	3	1	..	..	..	..	..	2	1	1
HUNSLET	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
HOLBECK	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
WORTLEY	..	..	..	1	..	..	1	..	13·0	..	1	..	4	3	..	1	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	1	..	..
KIRKSTALL	..	..	..	..	2	1	2	1	8·0	..	..	3	13	17	2	1	..	..	3	..	..	..	3	..	3	..	..	..	1	1	1	..	..	..
BRAMLEY	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
CHAPELTOWN	..	..	1	..	1	..	1	1	16·0	1	1	1	18	14	..	2	1	..	1	..	..	..	1	..	2	..	..	..	..	2	..	..	..	..
WHITKIRK	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
TOTALS	1	..	2	1	11	3	14	4	20·4	1	12	6	84	80	4	14	11	1	6	..	..	..	4	..	15	2	1	..	1	4	4	3	5	1

T.—Trapped and then going directly into drain. C.—Cut off over an outside gully. T.C.—Same, plus an inside trap. D.—Directly connected with sewer F.V.—Soil pipe continued full size above the eaves. T.W.C.—Trough water closet. See note and text.

NOTES TO PLEURO-PNEUMONIA TABLE.

As no second death occurred in any one house in 1893, the following information applies to both "death-houses" and "houses."

Duration of illness.—This column gives, for each district, the average length of time from the commencement of the symptoms to the date when information of the death reached our office.

Houses.—The twelve houses under the heading "back-to-back, &c.," include one "salt-pie" in the *South-East* district.

Density cf population.—The eighty-four inmates include the patients, and are for eighteen houses. There was no second fatal case in any one house.

Drainage disconnection.—(See also explanation page 61 and page 74, Annual Report, 1892.) Houses containing w.c., with soil-pipe not properly ventilated, are included amongst those not disconnected. Four houses were disconnected, and fourteen not disconnected.

Sink wastes.—All the death-houses had sinks.

Other inside drainage.—Every exit of waste water from the house to the drain, other than the sink, is included in these four columns, but many houses had no other inlet to the drain. These columns, consequently, will not balance the number of houses.

Outside drainage.—The last remark also applies to columns 28 and 29. Columns 26 and 27 (fall-pipes) will balance if one house in the *North*, which had no fall-pipe on the house itself, be added. No second fall-pipe to the same house is counted.

Closets.—Two death-houses had two extra conveniences. One in the *West* district (entered not F.V.) had also a trough water closet; and a house in *Chapeltown* district (entered not F.V.) had also a midden.

ascribed to broncho-pneumonia, catarrhal-pneumonia, or lobular-pneumonia. It is probable that many of the deaths certified simply as due to "pneumonia" might more properly belong to the catarrhal group, but we cannot of course go behind the record.

Some information in regard to the houses in which patients died from broncho-pneumonia will be found in table 25. I give, however, here two tables, one dealing with the 341 deaths ascribed to "pneumonia" and the other dealing with the 18 deaths ascribed to pleuro-pneumonia. As mentioned in a previous report, it was intended that the pleuro-pneumonia cases should be included along with the deaths from pneumonia, but as that was not done in the reports for 1890 and 1891 it was thought better to make a separate table last year in order that the returns might be comparable with those for previous years.

Time incidence of pneumonia is dealt with in an earlier paragraph. It will have been noticed that it differed somewhat from that of bronchitis and broncho-pneumonia.

Age incidence.—Of the 341 deaths from "pneumonia," 39 (or 11·4 per cent.) occurred in infants who had not completed their first year; 70 (or 20·5 per cent.) occurred in children between the ages of 1 and 5; 13 (or 3·8 per cent.) in children between 5 and 15—roughly the school-going age; 24 (or 7·0 per cent.) in young persons from 15 to 25; 149 (or 43·7 per cent.) in persons between the ages of 25 and 60; and 46 (or 13·5 per cent. in persons of more than 60 years of age. If the 18 pleuro-pneumonia deaths be added it will chiefly affect the age periods 1 to 5 and 25 to 60; the percentage of deaths at the latter age period becomes 44·6, or nearly 1 per cent. higher. On the other hand, there having been no death from pleuro-pneumonia between 1 and 5 the percentage of deaths at that age on the whole pneumonic group is reduced 1 per cent. to 19·5. On the whole 359 deaths the percentages (including the deaths from pleuro-pneumonia) at the several age periods are as follows:—11·1, 19·5, 4·2, 7·0, 44·6, and 13·6.

Sex incidence.—The 341 pneumonia deaths were distributed: 189 (or 55·4 per cent.) to the male and 152 (or 44·6 per cent.) to the female sex, or, including the pleuro-pneumonias, 203 (or 56·5 per cent.) were men or boys, and 156 (or 43·5 per cent.) women or girls; the addition of the 18 pleuro-pneumonias having slightly increased the incidence upon the sterner sex.

Time lost before we heard of case.—Of the 341 deaths from "pneumonia," 8 occurred in public institutions, and in 4 of these we were unable to ascertain the date of commencement of illness. Four others occurred in houses which were empty at the time of the inspector's visit, in most cases the occupants having left the neighbourhood. In 8 others, while information as to the house conditions was obtained, it was difficult to get an exact statement as to the date of the commencement of the illness. In some of these 8 the patient had been more or less ill for a long time. We therefore leave out 16 of the 341 cases, and in the remaining 325 fatal pneumonia cases, for which our information is approximately complete, the average time, from the commencement of illness to the date of our hearing of the death, was 18·3 days. If we add 17 cases of pleuro-pneumonia (the relatives of the eighteenth having left the neighbourhood) in which the same information was obtained, the average interval is raised to 18·4, the length of time which elapsed in the 17 pleuro-pneumonia cases having been 20·4 days.

School attendance.—The information which follows refers to 329 pneumonia death-houses, and 18 pleuro-pneumonia death-houses. Of the 341 deaths certified as pneumonia, 8 occurred in public institutions, the conditions of which have, as usual, been ignored as throwing no light upon the incidence of the disease. Into 4 houses our inspector was unable to obtain entrance, the people having left the neighbourhood; these reduce the 341 to 329. Of these 329 deaths, nine, and of the 18 pleuro-pneumonia deaths, about which our information was fairly complete, one, were amongst children actually attending school at the time of the attack. As the total number of deaths at the school-going age was 13 amongst the pneumonia, and 2 amongst the pleuro-

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pneumonia cases, it is possible that the non-attendance at school in some cases may have been owing to previous illness such as measles. Some, of course, of the 13 plus 2 deaths between the ages of 5 and 15 years, may have been those of children who had already commenced work. In fact, on referring to the inspector's reports, I find that of the 15 deaths between 5 and 15 years of age from pneumonia and pleuro-pneumonia, nine* are recorded as those of children at school; two, a boy and a girl, both of them 14 years of age, were at work; four were "at home," namely, a girl of 14, a girl of 10, and two boys of 5. Notification was not compulsory in Leeds in 1893, and the only case of other infectious disease coming to our knowledge in any of the houses in which these fifteen deaths in children between 5 and 15 occurred, was a case of erysipelas in a child of ten months, fatal on August 19th, in the house where the girl, aged 14, who was of working age, but "at home," occurred. We do not keep children away from school ordinarily on account of erysipelas in the house.

Through houses, &c.—Here, again, we deal with the 329 pneumonia houses, and the 18 pleuro-pneumonia houses, reduced from the total number as in the last paragraph. Of these 329 pneumonia death-houses, 214 were back-to-back, 17 were salt-pies, 7 others were single houses without an opening in the rear, the remaining 91 (or 27·7 per cent.) had a through draught, leaving 72·3 per cent. which had not. Of the 18 pleuro-pneumonia houses, 11 were back-to-back, 1 a salt-pie, and 6 were throughs. Of the whole 347 death-houses dealt with in the two tables, 97 (or 28 per cent.) had, and 250 (or 72 per cent.) had not a through draught.

Inmates and rooms.—The 329 fatal cases of pneumonia, reduced from the 341 as stated in the paragraph on school attendance, and about whose housing we had full information, lived in 327 houses or tenements. These 327 houses had 1,297 rooms, and, including the patients, 1891 inmates. This gives an average of nearly four rooms and of nearly 6 (5·8) persons to a house, and of 1·5 inmates to a room. Adding the 18 pleuro-pneumonias, we get altogether 345 houses, with an average of 5·7 inmates and 4·0 rooms to a house, and 1·4 (1·37) inmates to a room, as against 1·5 (1·46) in the "pneumonias" alone. When we deal with diarrhœa, we shall see that the rooms to a house were 3·4, and the inmates 5·6, while the number of inmates to a room was 1·6. At the time of the census the average number of inmates to a house was 4·7. The houses, therefore, in which fatal pneumonia occurred had rather more inmates than were found in diarrhœa death-houses, and considerably more than were found generally throughout the borough at the time of the census. On the other hand the houses were slightly larger than those in which diarrhœa had proved fatal, and the number of their inmates per room less.

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* The tenth death, of a school child, was that of a girl of 4.

Disconnection of drains.—Of the 329 pneumonia death-houses,* 11 had no drain, in 131 the drainage was completely disconnected from the sewers, and in 187 it was not. Adding the 11 houses without drain to those not disconnected, the drains were correctly dealt with in 131 out of 329, or 39·8 per cent., and incorrectly in 198, or 60·2 per cent.

Taking into account the 18 pleuro-pneumonia houses, the properly drained death-houses become 135, or 38·9 per cent.

Sink wastes.—The 11 houses with no drain had no sink, all the others had. In 6 the sink waste went directly into the outside drain, in 170 it was trapped (in 26 more than once), and then went to the sewer; in 142 it was cut off, in 11 of these without, and in 131 with, an inside trap. So far as the sink waste was concerned, therefore, in 142 of the 329 "pneumonia" houses, one or more sink wastes were present and properly treated. This corresponds to 43·2 per cent.

Of the 318 houses in which there was a sink, in 1·9 per cent. the waste went directly to the sewer, in 45·2 per cent. it had one, and in 8·2 per cent. two, traps, while in 3·5 per cent. it was "cut off" without, and in 41·2 per cent. with, an inside trap. The sink was therefore disconnected in every case in 44·7 per cent. of the houses in which one existed. Adding the 18 pleuro-pneumonia houses, all of which had sinks, the number of houses correctly drained as to this waste becomes 149 out of 347, or nearly 43 per cent.; the pleuro-pneumonia houses having slightly reduced the number of dwellings well drained in this respect.

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* Reduced from 341, as shown in paragraph headed "School attendance."

Other inside drainage.—In one or another there were, in addition to the sink drains, 66 other inside wastes, excluding duplicate sinks. These were not necessarily in different houses. One of the 66 went straight to the sewer, 33 were trapped, but not disconnected, 32 were disconnected over outside gullies, 28 of them having inside traps. The 18 pleuro-pneumonia houses had 4 such additional wastes, all trapped and cut off.

Fall-pipes.—In 291 of the 329 houses there were fall-pipes attached. In 38 there was no fall-pipe on the house itself. It does not follow that the latter was unprovided with conduits for rain water, as in many cases the rain would go down a fall-pipe on a neighbouring house. In the 291 houses with one or more fall-pipes attached, these were all cut off in 44, and 247 of them went directly into the drain. Seventeen of the 18 pleuro-pneumonia houses had fall-pipes attached. These were all cut off in 2, not all cut off in 15.

Other outside drainage.—Attached to the houses, and exclusive of the street gullies, were 38 other inlets to drains, 36 of them trapped, and 2 not. One of the pleuro-pneumonia houses had an additional trapped outside drain.

Closet accommodation.—We consider the 329* houses first as having each the use of one closet. Where more than one existed for a house we have selected that which, on the whole, was least sanitary.† Viewed in this way, 16 houses had inside water closets, and 81 had this class of convenience outside, 93 used trough closets, 131 middens, and 8 pails. Put as percentages of the 329 houses, 4·86 per cent. had inside water closets, 1·8 properly, and 3·0 improperly treated as to the soil-pipe; 24·6 had the use of water closets outside; 28·3 of trough closets; 39·8 of midden closets; and 2·4 of pails. Taking into account the 18 pleuro-pneumonia houses, the inside water closet houses become 6·0 per cent., 2·0 F.V., and 4·0 not F.V. The proportion of outside water closets is only altered a decimal point to 24·5. The houses with trough closets become 27·7; with middens, 39·2; with pails, 2·6. Houses with more than one class of convenience are mentioned in the notes to the table.

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* Reduced from the 341, as shown in the paragraph on "School attendance."

† This matter is dealt with more in detail under the head of diarrhœa later on.

Commoner zymotic diseases.

SMALL-POX.

Historical.—Small-pox has rarely been for any very long period entirely absent from Leeds. Attempts have been at various times made to deal with it by the erection of temporary hospitals. In the 1872-4 outbreak numerous cases of small-pox were taken into the Beckett Street Fever Hospital, and the Corporation provided a temporary wooden erection in the grounds behind the Leeds Union Workhouse. This they subsequently burned down.

About 1881-2 a wooden hospital was erected at Stoney Rock, affording not more than sufficient air space for 16 patients on the modern requirements. Somewhat later (in another building) two new wards, covering 1,308 and 1,117½ superficial feet respectively, suitable, so far as floor space is concerned, for nine and eight patients, but having only cubic space for eight and seven, were erected also in wood. In addition, another wooden building was erected to provide temporary dwellings for persons from infected houses. The latter covered 997 superficial feet, but was only 10 feet 1 inch high. It was found, however, inconvenient to isolate the families from infected houses so near the small-pox wards. The partitions within the building were removed, and it became available for the isolation of doubtful cases, or when no such existed, as an overflow for convalescents.

It could be used in an emergency for 5 patients. Counting all these buildings there was thus available adult small-pox accommodation for 36 acute cases. It was possible sometimes, without disadvantage, to put rather more than the number in some of the wards when the patients occupying them were convalescent. I have been told that at one time something like 100 patients have been placed (I will not say accommodated) in these buildings.

Small-pox in 1891-1892.—After the erection of these buildings small-pox for several years was only occasionally present in the town. In 1890 no case of small-pox came to our knowledge. A few cases occurred in the middle of 1891, and a good many in the autumn of that year. These occurred principally in the district of Hunslet, the majority of them some two miles away from the Stoney Rock Small-pox Hospital, in which, however, with one or two exceptions, they were all isolated. In the month of September the average number of small-pox patients in the hospital was 35. It was, therefore, although full, not overcrowded. During the following winter small-pox almost died out, and our hospital at Stoney Rock remained nearly empty.

Before dealing with the prevalence of the disease in 1893, it may be well to remind you of some details already presented in the special report on small-pox in 1892, and in the part of the annual report for the same year dealing with that disease. Some of the following is extracted verbatim from these reports, other parts are condensed:—

In the beginning of July a tramp, who had been staying at Greetland, where small-pox was at that time prevalent, developed the disease. He slept in a lodging-house in Meadow Lane, but was removed to hospital as soon as we heard of the case. So were also five other inmates of the lodging-house, a fortnight later, who had apparently contracted the disease from him. Three other sporadic cases occurred in August, 1892, in the ward in which the Stoney Rock Hospital was situated, but in different streets, and at distances from the hospital ranging from 383 to 800 yards Even with these new cases the daily average of patients in the Small-pox Hospital at Stoney Rock was under 10, and remained under 10 until October, notwithstanding the admission of a few other cases in August and September, including two from a lodging-house in York Street. After that the disease seemed to abate, and from the 19th of August to the 22nd of September, except the son of a patient already in hospital, and who developed the disease when under observation at the shelter, no fresh case occurred. Then one was reported (Z 266:1) at the opposite end of the town from the hospital, and two others, one in Wellington Lane, and the other in Roundhay Road, the last within 1,060 yards of the small-pox hospital, the other two more than a couple of miles away. Even when all three had been taken to hospital, there were only 6 cases of small-pox at Stoney Rock, and the daily average during the preceding five weeks had been 8·6. Then occurred cases in the Leeds Union Workhouse (situated within 467 yards of the walls of the hospital grounds) on the 3rd, 4th, 5th, 13th, and 19th of October. The one on the 13th was that of a labourer, out of employ, who had stayed previously in a common lodging-house in the North-East Ward. The occupants of the part of the lodging-house in which he slept, to the number of eight, were all taken to the sanatorium. None of them manifested any sign of the disease.

On October 11th a labourer from Chesterfield, who had arrived in Leeds, viâ Ardsley, on the 8th, and developed an eruption on the 10th, was removed to hospital from a lodging-house in the Central Ward. The occupants of the same room, to the number of eight, were isolated at the shelter. One of them, twelve days later, was transferred to hospital. None of the others, however, developed the disease. Up to the end of October, 1892, there was nothing very alarming about the amount of small-pox in the town. The average number of cases in hospital during the four weeks ended October 29th had been 10·9. The number in hospital on the last named date being 13.

At this time a man took ill within 567 yards of the walls of the small-pox hospital grounds, and died, unattended by any physician, on the 30th of October. It is stated that his eruption appeared on the 23rd. If so, he probably contracted the disease about the 9th of October. On the 9th there were 9 patients at

Stoney Rock, and the average for that and the nine preceding days had been 8·6. To this concealed case we were able to trace a large number of others, some in the same house, others in persons who had had clothes made up in the house during the time of the man's illness, or who had been on visiting terms with members of this family.*

Cases in hospital in 1892.—Altogether, during 1892, 125 small-pox patients were sent into hospital at Stoney Rock. The daily average of patients during the first seven months of the year was under 5; during the next two months, under 10. In October the daily average was 11, while in November it reached 35, and in December, 56. In this last month the hospital might, therefore, be said to have at least half as many patients again as there was air space for.

Weekly admissions in 1892 and first quarter of 1893.—The weekly admissions of new cases during the same months averaged less than one till the third week in July, when they ran up to 5. They averaged less than one for the next three weeks, and in the third week in August ran up to 7. They again averaged less than one for the next six weeks, and ran up to 5, followed by 2, 1, 2, and 5 successively. In the second week of November they ran up to 15, were 17 in the following week, after which they steadily fell (averaging 8 in the next five weeks) to 14 in the last week of the year.

In the several weeks of January, 1893, the admissions were 14, 10, 17, and 14; in February, 17, 13, 12, and 8; in March, 13, 8, 18, 7, and 19, excluding three cases† admitted from places outside the borough. This number of admissions, however, greatly taxed our accommodation, and as the patients could not be sent out while still in an infective stage, it raised our daily average in the hospital from 56 in December, 1892, to 60, 70, and 65, in January, February, and March, 1893.

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* Annual Report, 1892, pp. 31—35.

† January.—A navvy, who had tramped from Mexbro, viâ Sheffield, Huddersfield, and Bradford, to Leeds and Eccup. Arrived Leeds 13th, to Eccup 16th. Eruption, 18th January.

February.—A labourer came from Ringstone Edge, near Oldham, viâ Halifax. Reached Leeds, 25th; eruption, 23rd. Did not sleep in Leeds; asked advice at Infirmary, whence sent to hospital.

March.—Bricklayer's labourer tramping from Wakefield through Leeds for York. P.C. met and advised him to apply at sanatorium. Admitted to hospital, 13th; eruption, 12th March. Slept night of 12th in Wakefield. Died March 30th.

Necessity for further accommodation.—With an average of 65 patients in the first three months of 1893, the Sanitary Committee felt that they were scarcely doing justice to the patients or to the persons living in the neighbourhood of the small-pox hospital, and that they must deal with the continually increasing cases either by providing fresh accommodation in the neighbourhood of the existing hospital or elsewhere. The following extracts from their Minutes shew that the Hospitals Sub-Committee in particular were aware that the cases of small-pox were in excess of the accommodation, and were anxious to make provision for any further increase:—

> At a special meeting on the 19th of January, the Sub-Committee visited the Small-pox Hospital, and found the huts overcrowded. Resolved: That the Borough Engineer obtain tenders for the construction of an additional cooking range for the scullery, and for enlarging the present wash-houses and kitchen by adding a lean-to roof. That the Borough Engineer obtain tenders for the erection of another hut similar to those at present erected.
>
> On the 24th of January when the Minutes came before the Sanitary Committee for confirmation, it was reported that in consequence of the large increase of small-pox cases it was necessary that additional accommodation should be provided, without delay, for the isolation of patients, and that difficulties had arisen in the way of erecting an additional hut at Stoney Rock, and it was suggested by the Medical Officer of Health that a hospital should be constructed at Manston, on the portion of the estate proposed to be set apart for small-pox. Resolved: That the Medical Officer of Health's suggestion be adopted, and that the Borough Engineer forthwith prepare plans and obtain tenders for the erection of a Small-pox Hospital at Manston, for the accommodation of about 25 patients, the necessary works to be carried out under the direction of the Hospitals Sub-Committee.

The apparent contradiction in these resolutions perhaps requires a word or two of explanation. It will be remembered that so far back as the 6th of April, 1892, the Leeds County Council unanimously passed a resolution to secure the Manston Hall Estate, comprising 97 acres 2 roods and 34 poles for the purpose of a hospital for infectious diseases, and that the estate came into the possession of the Corporation on the 1st of July that year,* and the Committee felt, on re-considering the matter, that, being possessed of this estate, it would be better to place the new temporary hospital there rather than to build fresh sheds at Stoney Rock. They felt, in the first place, that by so doing they would not increase the number of cases in one part of the town; in the second place, that the workpeople employed would not be exposed to the danger of working in the immediate neighbourhood of the existing small-pox hospital; and, in the third place, that these workpeople's families would not incur the risk of having small-pox taken to them by their relatives.

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* Council Minutes and Report of the Hospitals Sub-Committee on proposed new hospital, October, 1893, page 4.

On the 26th of January, the Sanitary Committee proceeded to Manston Hall Estate, and after examining the grounds it was resolved that—

> The Small-pox Hospital be erected on a site to be selected by the Chairman, Medical Officer of Health, and Borough Engineer, on the north-easterly side of the estate, between the footpath and the mansion. That Messrs. Gould & Stevenson be employed to erect the Small-pox Hospital for about 25 patients, with Administration Department on measure and day work, at trade schedule of prices, and that they be required to complete the work within one month. . . .
>
> On the 16th of March, the Hospitals Sub-Committee examined the new overflow hospital, the building of which was approaching completion.

From the 9th of February this Sub-Committee, whose ordinary meetings were held once a month, had been meeting weekly. The new pavilion being now complete, the Chairman of the Sanitary Committee invited the Council to inspect the new hospital before it was occupied, which they did on April 7th, and on the 8th of April, 1893, the first case of small-pox was admitted.

The new hospital.—This new hospital was built of wood. The main pavilion contains two large wards of 14 beds each, separated by a nurses' room and lobby, and at the end of each large ward are two annexes, one containing closets and the other a bath room, both separated from the main building by a passage. There is a floor space of 162½ square feet per patient. Connected by an open passage to the nurses' room is a small annex behind, containing bath rooms and dressing rooms for patients being discharged, or for nurses going into the outer world. Separated by a garden plot is an administration also of wood, containing two kitchens, two store rooms, surgery, nurses' sitting room, ten bedrooms, bath room, and w.c.

Weekly admission during Second Quarter of 1893.—Small-pox, however, still shewed no sign of abatement. During the week ended the 1st of April, 19 new cases were admitted, and the following weeks 23, 41, 29, and 38; in the week ended the 6th of May, 41, and in the following weeks 24, 26, 26, and 11. This brings us to the week ended June 3rd. In the following weeks the admissions were 9, 20, 13, and 10, after which the number of cases greatly decreased.

Erection of Hospital Tents.—The number of patients thus admitted had, however, been greatly in excess of the accommodation provided, even with the additional 28 beds. Fortunately the increase happened in summer, and the Council resolved to put some of the patients under canvas. Double tents were obtained, proper floors laid, special ventilation arrangements were provided, and during the autumn a small encampment was thus formed in the neighbourhood of the administration buildings of the new wooden hospital at Manston, these serving as a basis of operations.

*Admissions during the Second Half of 1893.**—It has been said that the cases admitted during the week ended the 1st of July were 10. The same number of new cases were taken in the following week. In the second week of July the admissions were 2, followed by 4 and 1 in the two remaining weeks. In the first four weeks of August no case was admitted. In each of the weeks, ended the 2nd and 9th of September, a case was admitted. No further cases were admitted until the week ended 30th of September, when 5 were taken in. The fourth quarter of the year began with a blank record in the first week; 2 cases were admitted in the second; 6 in the third; and 1 in the fourth week. In November the numbers were 1, 7, 4, 7, and 2, and in December 4, 5, 11, and 2. The rise and fall of the admissions corresponded very closely with the ordinary seasonal curve of small-pox, and by the close of the year the number of small-pox cases in hospital had been reduced to 25, all these being accommodated at Manston in the new wooden hospital.

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* For total cases heard of in 1893 see under "Hospital isolation," p. 52.

TABLE 8.

Shewing cases of Small-pox heard of, deaths, cases, and death-rates per 1,000 of the estimated population, and case mortality per cent. in each ward and division of the city in 1893 (outsiders excluded).

Wards and Divisions.	Cases of illness, 1893.		Mortality, 1893.			Triennium 1891-2-3.	
	Number.	Per 1,000 estimated population.	Deaths.	Per 1,000 estimated population.	Case mortality per cent.	Cases.	Deaths.
Central	61	2·62	...	...	...	73	...
North	57	2·05	...	...	...	81	2
North-East	142	5·82	7	·29	4·9	178	9
East	69	2·63	6	·23	8·7	88	6
South	18	1·05	...	...	...	32	...
East Hunslet ...	12	·44	3	·11	25·0	37	4
West Hunslet ...	21	·85	...	...	...	21	...
Holbeck	18	·83	1	·05	5·5	26	2
Eastern division ...	398	2·07	17	·09	4·3	536	23
Mill Hill	6	·65	...	...	...	8	...
West	23	·92	1	·04	4·3	26	1
North-West... ...	15	·51	1	·03	6·6	21	2
Brunswick	43	1·86	3	·13	7·0	47	3
New Wortley ...	21	1·06	2	·10	9·5	24	2
Armley and Wortley	26	·91	3	·10	11·5	30	3
Bramley	16	·83	3	·16	18·8	27	5
Headingley	17	·50	...	...	...	21	...
Western division ...	167	·89	13	·07	7·8	204	16
City	565	1·48	30	·08	5·3	740	39

Cases arising near the old hospital.—While during the early part of 1893 the greater number of cases heard of had not lived in the neighbourhood of the hospital, many of them had occurred in lodging houses near the centre of the town, some of these in the same ward as the hospital itself. Towards the end of March, however, two cases were heard of in a house about 333 yards from the wall of the hospital grounds, in a street already referred to in which a patient had been taken ill the previous August, although no case of small-pox was known to have occurred in that street during the interval. A week later (April 3rd, 1893), a patient was removed from an adjoining street, and, a little later, several from some blocks of property between the Beckett Street Hospital and the one at Stoney Rock, and a few from the district immediately adjoining. Altogether, during the four weeks of April, in 32 houses within half a mile of the bounds of the hospital, new cases of small-pox appeared, and 13 in the week ended May the 6th. On the 10th of April I made a statement to the Sanitary Committee at their monthly meeting, as to the localisation of recent attacks of small-pox, and at the following meeting (May the 8th), shewed by means of a lantern slide (kindly made for me by Mr. Nichols from a map prepared in the interval, and dealing with the cases reported up to the 6th of May), the localisation of recent attacks. At the last-named meeting, the Committee resolved that the small-pox hospital be removed from Stoney Rock as soon as possible.

Destruction of Stoney Rock Hospital.—As soon as the tents were in full operation, and it was felt by the Sanitary Committee that they had provided, or could easily provide, sufficient accommodation for any probable increase in the number of patients, it was resolved to get rid altogether of the buildings at Stoney Rock. Accordingly they were burnt down on the 1st of September.

Although it is by no means certain that any bad result to the neighbourhood would have followed from the use of the Stoney Rock Hospital for the 36 patients for which there was air space, there could be no doubt that the placing of 60 patients in that space was fraught with grave danger to the patients themselves. There was also the circumstance that this small-pox hospital, which had been built well out of town in 1882, was gradually being approached, if not surrounded, by dwellings. Houses were creeping up to it, so that, at the time we are speaking of, there were some within 500 feet of the boundary wall on the West, and new houses had been recently built some 800 feet away on the North-west, and an estate had been laid out on the South-west, coming within 300 feet of the boundaries of the hospital grounds.

Local incidence of the disease.—A general sketch of the manner in which small-pox invaded the town has already been given. Of the 565 patients belonging to Leeds, including the 8 not removed to hospital, 30 died—a mortality of 5·3 per cent. Of these 398 occurred in the Eastern division of the borough, with a case mortality of 17 or 4·3 per cent.; 167 occurred in the Western division of the borough, with a mortality of 13 or 7·8 per cent. In the North-East Ward there were 142 patients, the largest number in any ward, with a case mortality of 7 or 4·9 per cent.

Annexed will be found a table giving the number of cases heard of in each ward, and the number of deaths, with approximate rates, per thousand of the population, of sickness and mortality from this disease. The number of cases heard of and isolated in hospital in each registration district will be found in table B in the Appendix, and the number of deaths in table C. The death-rate from small-pox, in districts, will be found in table 21. In all these tables corrections have been made for the actual place of usual residence.

PREVENTIVE MEASURES.

Hospital isolation.—The methods adopted to prevent the spread of small-pox were first and chiefly the isolation of the sick. The practice of removing cases to hospital which had been carried out in the previous year was continued in 1893 Altogether 573 cases of small-pox were heard of in Leeds during the 52 weeks of 1893. Out of this number 5 occurred in persons who arrived in Leeds with the eruption upon them, having slept in some other place the previous night, and were accommodated in our hospital. In addition to these were 3 taken into hospital to oblige neighbouring authorities.

Of the cases heard of in Leeds, including tramps, all but 8 were removed to hospital; that is to say, 98½ per cent. of the cases of small-pox we heard of were so treated. Nor did we wait for cases to be reported to us. When we knew of the existence of small-pox in any neighbourhood, we visited every house in that district in search of other cases. In this manner during the year the inspectors paid on this account no fewer than 17,501 visits in search of small-pox.* This number does not include the ordinary visits paid to houses in which small-pox was known to exist, for the purpose of obtaining information about the case, and examining the condition of the dwelling, or ascertaining whether proper disinfection had been carried out.

Isolation at home.—The 8 cases known of but not transferred to hospital, were as follows;—One in the North district (Z 397:4). Patient was a man of 40, who had a very slight illness, which was disappearing at the time the case was reported. The clothing of the rest of the family was disinfected, and they went away to stay with various friends at addresses given to the inspector. The house contained six rooms, and only the patient and his wife were allowed to remain at home. An inspector called daily to ascertain that isolation was efficiently kept up, and to see that the necessary supplies of food were provided for the inmates. The man had been taken ill on the 6th of April, the eruption appearing on the 9th. On the 27th his wife became ill, on the 28th an eruption appeared, on the 29th she was removed to hospital. She had not been re-vaccinated by her medical attendant. Seven other members of the family who had been sent away were all under the age of seventeen. I do not find that they were re-vaccinated, nor that any of them contracted the disease.

In the West district there were three cases. The first of these (Z 417:6) was heard of by the divisional inspector on the 9th of May. The case had not been reported to us by the medical man in attendance. The patient, a man of 43, was taken ill on the 25th of April, the eruption coming out on the

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* Part IV., table Ia.

29th. His wife nursed him. The only other inmate of the dwelling was the patient's father-in-law, a man of 79. The house, which consisted of five rooms, was visited repeatedly by the inspector, who saw that isolation was properly carried out. The wife was re-vaccinated as soon as the medical attendant diagnosed the disease. The father-in-law never entered the sick room. He procured food for the patient and his nurse and left it at their door, but lived himself entirely in the basement. Neither of the other inmates developed the disease, and we have no reason to suppose that any other neighbour suffered in consequence of the patient's remaining at home. Another case (Z 427:5) occurred in a large house in a terrace off Clarendon Road. Including the patient and nurse, there were nine inmates in this house of nine rooms. The case was a mild one, and there was some risk, on account of the very mildness of the case, that the necessary precautions would not be taken. We insisted, however, upon the complete isolation of the patient and her nurse, and made frequent visits to see that our instructions were carried out. No other member of the family, five of whom had been successfully re-vaccinated, developed the disease, and we have not traced the infection of any other case to this one. The third case (Z 439:2), in the West district, occurred in a house used as a draper's shop in North Street, Brunswick Ward. There were six inmates and seven rooms. The illness was not reported to us till the patient was nearly better. We carried out the disinfection. No other member of the family developed the disease. It is, of course, impossible to say that infection might not have been conveyed from the draper's shop, which was not closed during the time of the illness. Two children were attending St. Ann's School at the time of their father's attack, but remained away from school during the continuance of his illness. All the other members of this family were re-vaccinated when the case occurred.

In Hunslet, one case (Z 443:9) was left at home. There was some hesitation both on the part of the medical attendant and myself in pronouncing on the exact nature of the disease. The patient was a boy of 6. There were three others in the family, a child of two, who had been vaccinated, and the father and mother. They were all re-vaccinated, but in the two latter unsuccessfully. Isolation was carried out at home. In this case also the house was frequently visited, and the father stopped away from his work. The case occurred in the latter part of June, and the accommodation at our command for isolating doubtful cases was *nil.* No other member of the family developed the disease.

The case (Z 405:1) left at home in Holbeck was that of a child 3½ years old. About this case there was also a certain amount of doubt. The illness was exceedingly slight, and the eruption was disappearing when I visited, at the request of the medical attendant. There were six inmates and three rooms. When first heard of, on the 22nd of April, five days after the eruption, we arranged for the disinfection of the clothing of the other members of the family, and that the patient and his mother should be isolated in a separate room. The father and the rest of the family remained at home. The ward inspector visited daily and procured what food was necessary, and on the 17th of May the medical man in attendance, considering the patient well, the whole family were transferred to Manston cottages during the disinfection of their house. All except the patient were successfully re-vaccinated. No other case occurred.

In Kirkstall registration district, in one of the streets off Victoria Road, Headingley, a man of 30 (Z 376:1) developed small-pox in a house with five rooms. He was attended by a trained nurse and his wife. There was also in the house a servant girl. The members of the family were all successfully re-vaccinated. No one took the disease, and the whole house was disinfected on the 20th March, five weeks after the appearance of the eruption. We have no reason to suppose that any other case arose from this one.

The remaining case (Z 386:5) occurred in the Chapeltown registration district, at Bayswater Mount, Roundhay Road. The case was not reported to us at all. The patient's illness commenced on the 28th of February, when she called in a medical man. The eruption is said to have appeared on the 4th of March, but we had no information of the case until March 22nd. There were three other inmates in the six-roomed house. All were successfully vaccinated by their medical attendant. None of them contracted the disease. Cases appeared subsequently near by.

Disinfection of houses, clothing, &c.—As far as possible, when a patient was removed, the house was practically emptied of its inhabitants, who were transferred to the shelter cottages erected in the grounds at Manston, and, where possible, provided with dwellings to themselves. The clothes of those so removed were at once disinfected by steam, and they themselves remained at the cottages during the disinfecting and cleansing of their home. In most cases they were invited to remain during a longer period than was absolutely necessary for the disinfection of their houses, in order that they might be under observation, in case they should shew any signs of developing small-pox. The disinfection of houses was generally carried out pretty thoroughly. As already said, it comprised the disinfection by dry steam of the clothing of the inmates. In every case the sick room, after being stoved with sulphur, was stripped of its paper, if it had one, and limewashed, or if the walls were wainscotted or varnished, they were washed down with a strong solution of corrosive sublimate.

Isolation of persons exposed to infection.—The majority of persons in the shelter cottages were persuaded to remain over a fortnight. Out of 1,458 cases in this way isolated at the cottages, no fewer than 83 developed small-pox within a fortnight of the time of the disinfection of their clothes. The greatest care was taken to isolate any who showed signs of illness. All were visited daily by the Resident Medical Officer, and as soon as a case was clearly small-pox it was removed to hospital. When any case arose in a family, the other members of that family were requested to remain for a longer period in isolation, and in no case is there any reason to suppose that any person isolated at the shelter contracted the disease there. As already said, 1,458 persons were isolated in the sanatorium; 901 of these remained at least ten days under observation; 36 others developed small-pox within ten days. Of the 937 cases thus isolated, 83 were attacked with small-pox while under observation, and removed at once to hospital. Of 521 who went out apparently well after being in the sanatorium for a period of less than ten days, some of them, indeed, a very much shorter time, 7 developed the disease after returning home. Of course, of these 521, a great many were persons who had been only very slightly exposed to the infection of small-pox; in some cases neighbours who had been present in the house, and who simply went to the sanatorium to have their clothes disinfected. All persons, however, are excluded who were apparently ill during the time they were in the sanatorium. They are included in the 36. Two other persons remained only two hours each at the cottages, it being found that their illness had already commenced.

Re-vaccination.—In addition to the immediate separation of any inmate who showed any malaise, the Resident Medical Officer was able to persuade nearly all the persons removed from infected houses to undergo re-vaccination where he thought it necessary. Young children with good vaccination marks were of course not re-vaccinated. Although it does not seem that the re-vaccination of persons already exposed to the infection of small-pox, in all cases prevented their developing the disease, Mr. Pearson is strongly of opinion that where an attack of small-pox manifested itself during the incubation period of vaccination, the latter exercised a modifying influence.

VACCINATION.

Previous condition as to vaccination of persons exposed to small-pox.—It has been said that 1,458 persons were isolated for a longer or shorter period. In regard to 93 of these, no record is in the books as to their condition as to previous vaccination. In regard to the remaining 1,365, in 57 there was no sign of vaccination, 65 had admittedly not been previously vaccinated, 36 are stated in the books to have shown signs of vaccination, but the marks are not described in detail. In 257 there was one mark or two poor marks. In 287 there were two good marks, or three less perfect ones. In 616 there were at least three fair marks, in many of them more. In 7 it was somewhat doubtful whether the marks were really those of vaccination at all. Forty persons had previously had small-pox. These results are obtained by going carefully over the records kept by Mr. Pearson in the sanatorium books. There is perhaps a little doubt as to the exact classification of the 257, 287, and 616, as the character of marks is differently described at different periods of time. About such terms as "fair marks," there has been some difficulty whether to consider them as poor or good. Where the marks were thus described as fair, not as either poor or good, they were allocated to the first or second class alternately, where there were two and where there were three "fair marks," they were distributed to the second or third class alternately. All cases in which more than three marks are described are put in the third class as "well vaccinated."

It is evident, however, that neither the mere number nor size of the marks can be regarded alone, and the classification is only an approximate one. The protection indicated by a single good, but recent mark, is probably greater than that shewn by four imperfect marks, the result of a single vaccination thirty or forty years ago. It would be interesting, if time allowed, to classify all these marks, not only as to the extent but as to their antiquity. In the same way the question of re-vaccination has been entirely left out. Re-vaccination often leaves little or no mark, while it probably confers a nearly complete immunity upon the person re-vaccinated.

Amongst the 57 who had no sign of vaccination, 5 (or 9 per cent.) developed small-pox ; 4 of them in the sanatorium, 1 after leaving it. Of the 65 admittedly not vaccinated, 16 (or 25 per cent.) developed small-pox ; 14 while under observation, 2 after leaving the sanatorium. Of the 7 cases whose marks were doubtful, 2 developed small-pox. Altogether of the 129 cases in which there was no evidence of vaccination, or of previous small-pox, 23 (or 18 per cent.) were subsequently attacked, while of the 1,196, who had some sign of vaccination, 64 (or only 5 per cent.) developed small-pox. Of the 40 who had previously had small-pox, none developed the disease, and of the 93 about whom the information had not been recorded at the time of their admission to the sanatorium, 3 developed small-pox. Although the condition of the vaccination as to these 3 is known, they are excluded from the return as it had not been put on record before the development of the disease.* Dividing the cases in which the vaccination marks were described in detail into three groups, "poorly," "fairly," and "well" vaccinated, the percentages of attacks were as follows:—In the first class rather less than 6 per cent., in the second class rather less than 4 per cent., and in the third class rather more than 6 per cent. developed the disease. This, without any other explanation, would seem to indicate that the number of marks was not of so much importance as has been supposed, but, on the other hand, it must be remembered that a very large number of children are now vaccinated only in one place. All such have been placed in the first class as "badly" vaccinated, but vaccination although poor, if recent, affords a large amount of protection, and the recentness of the vaccination is probably a larger factor in determining its protectiveness than the number of marks.

Age of attack.—Deducting the 5 inmates of the cottages, about whose age there is no record, altogether 1,453 persons passed through the sanatorium; their average age was 22 years. Of these, 83 developed small-pox before, and 7 after leaving the sanatorium. The average age of these 90 persons was 21 years. It would seem, therefore, that of the members of a family exposed to infection, irrespective of vaccination, the age differed little amongst those attacked and those not attacked. It has, however, to be remembered that these figures exclude the members of the family who had already been attacked.

Altogether, of the 565 cases of small-pox heard of, the average age was a little under 25·5. The average age, it has been said, of the 90 (83 transferred from the sanatorium and 7 taken ill after leaving the sanatorium) was 20·8. Deducting these 90 from the 565, the average age of the remaining 475, who were treated at home, or went to hospital without having been in the sanatorium, was 26·3. It would therefore appear probable that the older members of a family first succumbed to the attack; that of those of their families who were transferred to the sanatorium, the attacks were pretty equally distributed according to age—the average age of the inmates of the sanatorium having been as already said 22 years, four years less than the average age of those attacked in the first instance.

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* Two are described in the hospital books as imperfectly, and one as well, vaccinated. The two cases remaining only two hours at the shelter are also excluded, one *æt.* 28 had one vaccination mark, the other an infant, had not been vaccinated at all.

Influence of vaccination upon recovery.—What information we have as to the vaccination of the 7 cases not sent to hospital has been already given. Of the 586 cases who passed out of the small-pox hospital during 1893, 257 were recorded as "well vaccinated," 241 as "imperfectly," 46 as "unvaccinated," and 42 were said to have been vaccinated, but had no mark. Of the last group the mortality was 9·5 per cent.; of the "unvaccinated," 28·2 per cent.; of the "imperfectly" vaccinated, 5·3 per cent.; of those who shewed marks of having been well vaccinated, *nil.*

TABLE 9.

Shewing vaccination marks, form of disease, deaths, and mortality per cent.*

	No.	Mild Forms.	Discrete Forms.	Confluent Forms.	Hæmorrhagic Forms.	Deaths.	Mortality per cent.
†Well Vaccinated … …	257	119	135	3	…	…	…
†Imperfectly Vaccinated …	241	37	174	28	2	13	5·3
‡Said to be Vaccinated, but no sign	42	3	23	15	1	4	9·5
‡Unvaccinated … … …	46	7	6	33	…	13	28·2
TOTAL … …	586	166	338	79	3	30	5·1

* From report of Resident Physician.

† 39 of the vaccinated cases were either vaccinated at the sanatorium, or vaccinated previously to admission to the sanatorium, but apparently after they had received the infection. One of these died.

‡ 16 of the vaccinated cases had primary vaccination performed at the sanatorium, or previously to admission to the sanatorium. Three of these died. Two persons refused vaccination at first, but submitted later.

TABLE 9a.

Shewing number of visible vaccination cicatrices each case, the number of deaths, and the mortality per cent.*

	Cases.	Deaths.	Mort. per cent.
Six Cicatrices	3	...	nil.
Five do.	2	...	nil.
Four do.	89	...	nil.
Three do.	144	3	2·0
Two do.	184	4	2·1
One Cicatrix	76	6	7·8
No Cicatrices	88	17	19·3
TOTAL	586	30	5·1

I extract two tables illustrating this point from the report of Mr. A. E. Pearson, Resident Medical Officer to the City Infectious Hospitals. The notes at the foot of the first of these tables is perhaps capable of being misunderstood. Thirty-nine small-pox cases are grouped in one or other of the first two lines according to conditions of mark, irrespective of the re-vaccination which had been performed after exposure to infection. In the same way 16 vaccinated for the first time in the sanatorium are included amongst the unvaccinated, as they had contracted the disease before vaccination. In some of these cases the vaccination or re-vaccination was not performed until several days after the exposure of the patients to infection at home.

MEASLES.

It has been already said that measles were somewhat prevalent during the two earlier quarters of the year. The average annual death-rate for the three preceding years (1890-2) had been 0·4

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* From report of Resident Physician.

TABLE 10.

Measles—Death-houses. Fifty-two weeks ended December 30th, 1893.

REGISTRATION DISTRICT.	AGES OF CASES.						SEX.		DAYS FROM ATTACK TILL HEARD OF.	AT SCHOOL.	HOUSES		DENSITY OF POPULATION.		DRAINAGE.																CLOSETS.					
																	INSIDE.								OUTSIDE.				W.C.					
																	SINK.				OTHER.				FALL PIPE.		OTHER.		INSIDE.					
	0–1	1–5	5–15	15–25	25–60	60 +	M.	F.			BACK TO BACK, &c.	THROUGH.	INMATES.	ROOMS.	DISCONNECTED.	NOT DISCONNECTED.	T.	C.	T.C	D.	T.	C.	T.C	D.	D.	C.	T.	D.	F.V.	Not F.V.	OUTSIDE.	T.W.C.	MIDDEN.	PAIL.
COLS. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
NORTH	21	36	2	..	..	..	36	23	19·6	1	42	6	255	129	7	39	39	..	7	..	2	..	..	..	23	8	1	..	..	..	4	27	17	..
WEST	9	36	2	1	..	..	31	17	19·7	8	35	12	300	170	11	35	34	1	10	1	3	1	2	1	26	10	3	..	4	2	12	16	11	2
SOUTH-EAST	15	49	5	..	..	..	29	40	17·6	3	62	6	380	197	15	51	47	1	14	4	1	..	..	..	49	9	5	..	..	..	4	32	21	11
HUNSLET	23	60	2	..	..	..	35	50	15·5	6	71	14	464	258	33	50	46	..	36	1	17	..	3	..	76	7	14	..	1	3	18	27	35	1
HOLBECK	1	18	1	..	..	..	10	10	15·8	2	15	5	117	53	5	14	10	1	5	3	1	..	..	..	13	6	2	..	..	..	3	11	5	1
WORTLEY	2	8	2	..	..	..	7	5	15·6	2	9	3	84	57	5	7	7	..	5	..	..	..	2	..	9	3	1	..	1	..	1	1	9	..
KIRKSTALL	9	15	2	..	..	..	12	14	18·5	3	21	5	165	90	6	20	19	..	7	..	1	..	1	..	24	..	3	..	1	1	8	2	14	..
BRAMLEY	4	9	1	..	..	..	9	5	13·0	2	10	3	72	35	4	4	4	..	4	..	..	..	..	..	9	2	..	..	..	..	1	..	12	..
CHAPELTOWN	1	4	1	1	..	..	2	5	16·3	3	2	5	37	30	4	3	2	..	4	1	..	..	2	..	5	1	..	..	1	..	2	..	4	..
WHITKIRK	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
TOTALS	85	235	18	2	..	..	171	169	17·4	30	267	59	1874	1019	90	223	208	3	92	10	25	1	10	1	234	46	29	..	8	6	53	116	128	15

T.—Trapped and then going directly into drain. C.—Cut off over an outside gully. T.C.—Same, plus an inside trap. D.—Directly connected with sewer F.V.—Soil pipe continued full size above the eaves. T.W.C.—Trough water closet. See note and text.

NOTES TO MEASLES TABLE.—DEATH-HOUSES.

The information in this table (except under head of density of population) refers to "death-houses," the facts about the same house being repeated for every fatal case which occurred in it.

Duration of illness.—This column gives, for each district, the average length of time from the commencement of the symptoms to the date when information of the death reached our office. The numbers, however, refer only to 336 cases instead of 340, information not having been completely obtained in four cases—one in each of the following districts:—*South-East*, *Hunslet*, *Wortley*, and *Bramley*.

Houses.—Column 12 deals with 267 houses, of which 250 were "back-to-backs," 15 "salt-pies," and 2 single houses without apertures in the rear wall. The latter were both in the *Bramley* district. The salt-pies occurred: 9 in the *South-East*, 2 each in *Hunslet* and *Wortley*, and 1 each in the *North* and *West* districts. Of the actual houses as distinguished from the death-houses, 241 were back-to-back, 14 salt-pie, and 2 single houses without a through draught. The remaining 57 (making up the 314) were through houses. Second deaths occurred in 2 through houses, 1 salt-pie, and 7 back-to-back houses. In an eighth back-to-back house there were 3 deaths.

Density of population.—The number of inmates or rooms is not re-counted where a second case occurred in the same house. The figures given deal with 314 houses in which 326 deaths occurred.

Drainage disconnection.—(See also explanation p. 61 and p. 74 Annual Report, 1892.) Houses containlng w.c., with soil-pipe not properly ventilated, are included amongst those not disconnected. Ninety death-houses were disconnected, 223 not disconnected, and 13 had no drain. The corresponding actual houses were 87, 214, and 13. In each of 3 disconnected houses there was a second death. In each of 7 undisconnected houses there was a second death, and in an eighth there were three deaths.

Sink wastes.—Thirteen houses had no sink. Of these 5 were in the *Bramley*, 2 each in the *North*, *South-East*, and *Hunslet*, and 1 each in the *West* and *Holbeck* districts.

Other inside drainage.—Every exit of waste water from the house to the drain, other than the sink, is included in these four columns; but many houses had no other inlet to the drain. These columns, consequently, will not balance the number of houses.

Outside drainage.—The last remark also applies to columns 28 and 29. Columns 26 and 27 (fall-pipes) will balance if 17 houses in the *North*, 11 in the *West*, 10 in the *South-East*, 2 in *Hunslet*, 1 in *Holbeck*, 2 in *Kirkstall*, 2 in *Bramley*, and 1 in *Chapeltown*, which had no fall-pipe on the house itself, be added. No second fall-pipe in the same house is counted.

Closets.—Three death-houses had 4 extra conveniences. One death-house in the *West* and 1 in the *Chapeltown* district (each entered F.V.) had each an extra outside water closet. In *Wortley*, a house (with a water closet F.V.) had two other similar conveniences. All three were single death-houses.

TABLE 11.

Measles.—Recovery-houses. Fifty-two weeks ended December 30th, 1893.

REGISTRATION DISTRICT.	AGES OF CASES.						SEX.		DAYS FROM ATTACK TILL HEARD OF.	AT SCHOOL.	HOUSES		DENSITY OF POPULATION.		DRAINAGE.														CLOSETS.					
																	INSIDE.								OUTSIDE.				W.C.					
																	SINK.				OTHER.				FALL PIPE.		OTHER.		INSIDE.					
	0–1	1–5	5–15	15–25	25–60	60 +	M.	F.			BACK TO BACK, &c.	THROUGH.	INMATES.	ROOMS.	DISCONNECTED.	NOT DISCONNECTED.	T.	C.	T.C	D.	T.	C.	T.C	D.	D.	C.	T.	D.	F.V.	Not F.V.	OUTSIDE.	T.W.C.	MIDDEN.	PAIL.
COLS. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
NORTH	5	25	16	..	..	..	19	27	24·8	23	45	1	140	66	6	40	40	..	6	..	..	..	1	..	21	1	1	..	..	..	5	37	4	..
WEST	8	92	70	2	..	..	86	86	15·6	101	120	52	670	476	66	106	93	5	67	2	1	4	12	..	99	34	21	..	9	15	59	64	25	..
SOUTH-EAST	..	..	1	..	..	..	1	..	6·0	1	1	..	4	4	..	1	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	1	..
HUNSLET	2	21	5	..	..	..	11	17	19·4	13	25	3	138	78	4	23	20	..	7	..	6	..	1	..	25	..	3	..	..	3	8	2	14	1
HOLBECK	..	1	..	..	..	..	..	1	14·0	1	1	..	8	2	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	1	..	..
WORTLEY	..	2	2	..	..	..	1	3	8·2	2	3	1	18	10	..	4	4	..	..	..	..	..	..	..	4	..	..	..	..	..	1	..	3	..
KIRKSTALL	3	42	45	2	..	..	44	43	22·2	52	70	22	233	196	28	64	63	..	29	..	2	..	29	..	85	5	2	..	9	1	57	2	23	..
BRAMLEY	4	65	42	..	..	..	57	54	12·9	67	100	11	535	290	36	57	56	3	33	1	..	..	1	..	89	10	2	..	1	..	..	..	110	..
CHAPELTOWN	..	..	3	..	..	..	2	1	17·7	3	3	..	9	6	..	3	..	..	3	..	..	..	..	..	..	3	..	..	..	3	..	..	..	..
WHITKIRK	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
TOTALS	22	248	184	4	..	..	221	237	17·3	263	368	90	1755	1128	140	298	282	8	145	3	9	4	44	..	324	54	29	..	19	22	130	106	180	1

T.—Trapped and then going directly into drain. C.—Cut off over an outside gully. T.C.—Same, plus an inside trap. D.—Directly connected with sewer F.V.—Soil pipe continued full size above the eaves. T.W.C.—Trough water closet. See note and text.

NOTES TO MEASLES TABLE.—RECOVERY-HOUSES.

The information in this table (except under head of density of population) refers to "case-houses," the facts about the same house being repeated for every case which is known to have occurred in it.

Duration of illness.—This column gives, for each district, the average length of time from the commencement of the symptoms to the date of our first hearing of the illness.

Houses.—Column 12 deals with 368 houses, of which 332 were back-to-backs, 33 single houses without aperture in the rear wall, and 3 "salt-pies." The latter were in the *West* district. The single houses without apertures in the rear wall were 30 in the *Bramley*, 1 in *Kirkstall*, and 2 in the *Wortley* districts. Of the actual houses, as distinguished from the case-houses, 217 were back-to-back, 2 salt-pie, and 20 single houses without a through draught. The remaining 60 (making up the 299) were through houses.

Density of population.—The number of inmates or rooms has not been recounted where a second case occurred in the same house. The figures given deal with 299 houses in which 458 cases occurred.

Drainage disconnection.—(See also explanation p. 61 and p. 74, Annual Report, 1892.) Houses containing w.c., with soil-pipe not properly ventilated, are included amongst those "not disconnected." One hundred and forty case-houses were disconnected, 298 not disconnected, and 20 had no drain. The corresponding actual houses were 88, 197, and 14.

Sink wastes.—Twenty case-houses had no sink. Of these 18 were in *Bramley* and 1 each in the *Hunslet* and *Holbeck* districts.

Other inside drainage.—Every exit of waste water from the house to the drain, other than the sink, is included in these four columns, but many houses had no other inlet to the drain. These columns, consequently, will not balance the number of houses.

Outside drainage.—The last remark also applies to columns 28 and 29. Columns 26 and 27 (fall-pipes) will balance if 24 houses in the *North*, 39 in the *West*, 3 in *Hunslet*, 2 in *Kirkstall*, and 12 in *Bramley*, which had no fall-pipe on the house itself, be added. No second fall-pipe in the same house is counted.

Closets.—Five case-houses had 6 extra conveniences. One in the *West* district (entered not F.V.) had also the use of a midden 18 yards away. A house also in the *West* in which 3 cases occurred, and which is entered 3 times under F.V., had also an additional F.V. closet. In *Kirkstall*, a house (entered F.V.) had 2 additional outside water closets.

per 1,000 of the population; that for 1893 was 0·9, an increase of 0·5. Our rate, however, in the triennium (1890-2) had been lower than in the quinquennium preceding it, our average rate in 1885-9 having been 0·6.

Time incidence.—Our most exact information about this disease is from the death returns. During the fourth quarter of 1891 five deaths were registered from this cause. In the four successive quarters of 1892 the deaths were 4, 6, 13, and 50 respectively. The deaths in the last quarter of 1892 were most frequent in the middle of October and the end of November; during the five weeks of September they had averaged 3 a week. In the first quarter of 1893 150 deaths were registered from this cause. The weekly average in January was 8, in February 7, in March 18. In the second quarter of 1893 157 deaths were registered; the weekly average in April having been 21, in the four weeks ended May 27th, 14, and 4 in the remaining five weeks of the quarter. In the third quarter of 1893 the deaths fell to 26—the weekly average having been 4, 2, and 1 respectively for July, August, and September. In the fourth quarter there were 8 deaths in the thirteen weeks, the average in each month having been less than one death a week..

Age incidence.—Of 340 deaths from measles registered in the fifty-two weeks of 1893, 25 per cent. were those of infants under one year; 41·5 per cent. of children between one and two years of age; 27·7 per cent. of children between two and five; 5·0 per cent. of children between five and ten; 0·3 per cent. of children between ten and fifteen, and 0·6 per cent. of persons above fifteen. It is evident that the highest mortality was in the second year of life, that the first year had nearly the same proportion of deaths as the third, fourth, and fifth years collectively, while above five years of age the death-rate was exceedingly small.

Twelve of the deaths which occurred in public institutions we could not refer to any known house in the city. Deducting these, and two cases in which full information could not be obtained, the remaining 326 cases occurred in 314 houses; twelve houses having had more than one death. In these 314 houses we ascertained that 79 other cases of measles occurred during the year, where the patients recovered. Deducting 2, as to which our information is incomplete, the remaining 77 recoveries occurred at the following ages: 7·8 per cent. under one; 10·4 per cent. between one and two; 48·1 per cent. between two and five; 31·2 per cent. between five and ten; 2·6 per cent. between ten and fifteen, and none above that age. It will therefore be noticed that in the very same houses in which the 326 patients died of measles, 77 other children recovered, and that of these 77 recoveries in death-houses, by far the greater number were above the age of two years, and nearly half of them between the ages of two and five.

In addition to these cases we have information in regard to 458 cases of measles which occurred in 299 houses in which no death was registered from this disease during the year. Although we have the exact ages in the zymotic book they have not been got out in the table. So far, however, as they are dealt with in the age groups contained in the table, they may be advantageously compared with those in the corresponding table of fatal cases. The percentage under one in recovery-houses* was 4·8, in death-houses* 25; the percentage between one and five in recovery-houses was 54·2, in death-houses 69·1; the percentage between five and fifteen was 40·2 in recovery-houses, and 5·3 in death-houses; while above fifteen, the percentage in recovery-houses was 0·9, and in death-houses 0·6. In houses, therefore, in which measles had not proved fatal, so far as our information goes, there was a smaller proportion of children under one attacked by the disease. There was also a smaller proportion (though the difference was much less) of attacks in recovery-houses than of deaths in death-houses at the age period one to five; but above five the percentage of attacks in recovery-houses was nearly seven times that of deaths in death-houses. It is difficult to put these figures in such a way that the expression of them may not involve a mis-statement. Their meaning seems to be, like the meaning of the figures in the previous paragraph, that of a given number of children attacked, those whose ages are under five stand far the least chance of recovery, and this to some extent irrespective of the condition of the house.

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* For use of words death-houses and recovery-houses see under "House conditions," page 69.

Sex incidence.—In the death-houses,* of the 340 fatal cases 50·3 per cent. were boys and 49·7 girls. In the same houses of 77 recoveries, 57·1 were amongst boys and 42·9 amongst girls. The attacks, therefore, in these houses seem to have been greatest amongst boys. The fatality amongst boys seems also greater, although not so in proportion to the attacks. In houses in which all children attacked, so far as we know, recovered, 48·3 per cent. were boys and 51·7 girls. Adding the 458 recoveries in recovery-houses to the 77 recoveries in death-houses, we get 535 known recoveries, and of these 49½ per cent. were boys, 50½ girls.

It would seem, therefore, as if on the whole boys have a slightly greater tendency to die of measles. The same inference follows if we take the total number of investigated attacks amongst boys which were 436, of which 39¼ per cent. were fatal, and compare them with the 439 investigated attacks amongst girls, of which 38½ per cent. were fatal. Again, in death-houses 20 per cent. of the cases heard of were fatal amongst boys and 16 per cent. amongst girls. It is not well, however, to attach too much importance to this information. If notification of measles were compulsory, and we heard of all cases, such comparisons would have greater value.

Time lost before we heard of case.—The fatal cases in death-houses (336) had been ill an average of 17·4 days before information of the illness reached our office. The cases in recovery-houses had been ill an average of 17·3 days.

School attendance.—Of 326 fatal cases in death-houses,* 30 (or 9 per cent.) were in attendance at school. Of 458 non-fatal cases in recovery-houses,* 263 (or 57 per cent.) were attending school at the time of, or immediately before attack. The fact that a smaller proportion of the fatal cases were attending school is probably due to the circumstance already pointed out that measles was more fatal at the earlier age periods.

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* For use of words death-houses and recovery-houses, see under "House conditions," page 69.

HOUSE CONDITIONS.

The information which follows deals chiefly with 326 fatal cases fully investigated, and 458 non-fatal cases, the latter recovering in houses in which no death from measles occurred during 1893. As our information was got, in the first instance, almost entirely from the death returns, every death registered from measles in the city has been as far as possible investigated. Fourteen deaths occurred in public institutions, and twelve of these could not be referred to any house within the borough. As to two other cases living in small houses, one in Bramley and one in South-East Leeds, the tabulated information required for columns 11 to 35 being incomplete, they have been neglected. These columns, therefore, deal with 326 fatal cases. As already said, these 326 deaths occurred in 314 houses, but in the table the house in which more than one death occurred is counted again for every death, and the table is one of "death-houses." The corrections necessary to convert "death-houses" into houses will be found in the notes to the table. In addition to the 326 fatal cases occurring in these houses, 79 others were heard of in which the patient recovered. Full information was obtained in 77 of these, but it is not repeated for each case in table 10.

The 458 recovery cases which occurred in 299 houses in which there was no measles death during 1893, are dealt with in table 11. The house conditions are recounted for each case, and the table is called one of "recovery-houses." The number 458 runs throughout the table. In regard to the information obtained in this table, it is perhaps desirable to state that as no official notice of measles is received except in fatal cases, those dealt with in this table were heard of by private inquiry, such inquiry being often instituted on account of deaths in the neighbourhood. Information was also obtained from schools as to absentees, and I take the opportunity of thanking the various teachers, attendance officers, and school officials for the readiness with which they have furnished valuable information to our inspectors. From the foregoing it will be understood that while to some extent the death table indicates the prevalence of the disease in the various districts, the recovery table does so to a less extent, some districts having been more thoroughly searched than others.

Through houses, &c.—Of the death-houses 18·1 per cent. had a through draught; of the recovery-houses 19·4.

Inmates and rooms.—The 314 houses in which the 326 patients died had 1,019 rooms and 1,874 inmates, an average of 3·25 rooms and 5·97 inmates to a house, and of 1·84 inmates to a room. At the time of the census the average number of inmates to a house was 4·7 for the city. The number of inmates to a house was therefore in excess of the average number throughout the town at the time of the census. In the 299 houses, in which the 458 recovery cases occurred, and in which there was no death from measles during the year, there were 1,128 rooms and 1,755 inmates, an average of 3·77 rooms and 5·87 inmates to a house. The number of inmates to a room was therefore 1·56. It will be noticed that while the total number of inmates to a house was greater in measles, both in recovery and death-houses, than at the time of the census, it was slightly less amongst the recovery than amongst the death-houses, but this difference is still more marked when we take the ratio of inmates to rooms. In the death-houses this number was 1·8, in the recovery-houses 1·6. It will be remembered that in former reports I have drawn your attention to a similar relationship between fatal measles and the more populous houses. (Special Report on Measles, 1891, page 18. Also Annual Report, 1892, page 46.)

Sink wastes.—Of the 326 death-houses 13 had no sink; 10 had sinks in which the waste pipe went untrapped to the drain; 208 (of which at least 30 had also box traps) had an S trap, but were not severed from the sewer; 95 had all their sinks cut off outside the house; 92 with, 3 without, an inside trap. Put in the form of percentages of the whole 326, 3·99 had no sink, 66·88 had sinks, but were connected to the drain, 3·07 per cent. without and 63·81 per cent. with an inside trap; 29·15 per cent. were properly disconnected from the sewer, 0·92 without and 28·23 with an inside trap. The corresponding figures in regard to recovery-houses were as follows:—4·37 per cent. had no sink, 62·24 per cent. had a sink waste connected to the sewer, 0·66 without, 61·58 with an inside trap; 33·41 per cent. had all their sink wastes disconnected from the sewer, 1·75 without, and 31·66 with, an inside trap. Comparing the two groups the houses without sinks were a little more common amongst recovery-houses, but the number of houses compared is very small. Undisconnected sinks were more common amongst the death-houses; and the houses in which every sink was properly cut off were more common amongst the recovery-houses. Dealing only with houses that had sinks, amongst the death-houses, 69·6 per cent. were not severed from the sewer, 30·4 were; whilst amongst the recovery-houses 65·1 per cent. were not, 34·9 per cent. were, disconnected from the sewer. Deaths from measles would appear to have been more common in houses whose sinks were not severed from the sewer.

Other inside drainage.—Information is given in the tables as to all the inside drains, other than the sink, found in these houses, but these groups of columns do not balance, as some houses had no drain other than the sink, and some had more than one, whereas in the columns dealing with the sink the balance has been effected by taking the worst form of sink, if more than one existed in the house, and dealing only with one sink in each house.

Disconnection of drains.—Taking into account for each house the question of whether (1) its sink waste, and every other waste, was disconnected from the sewer, and (2) (where there was an inside water closet) if the soil-pipe was properly ventilated, the whole 326 death-houses and the 458 recovery-houses have been classed in columns 16 and 17, according as disconnection of wastes and ventilation of soil-pipe had been effected or otherwise. Amongst the 326 death-houses were 13 which had no drain, adding these to 223 not severed from the sewer, the drains in 236 out of 326 houses were improperly dealt with, that is to say in 72 per cent. The corresponding number in the recovery-houses was 69 per cent. If, however, we disregard altogether the houses without drains, and take the percentage of disconnected and non-disconnected houses, amongst those which had some kind of drain, it will be found that disconnection had not been carried out in 71 per cent. of the death-houses and in 68 per cent. of the recovery-houses. Whichever way of regarding these figures is adopted, so far as they go, they point to a greater tendency to recovery in houses severed from the sewer.

Closet accommodation.—Dealing in each case only with one, and that the least sanitary, form of closet for each house, amongst the 326 death-houses the following percentages obtained. In both cases 39·3 houses had midden privies, while 4·6 of the death and 0·2 of the recovery-houses had pail-closets. The dry system obtained therefore in 43·9 per cent. of the death-houses and 39·5 of the recovery-houses. Trough water closets were the rule in 35·6 of the death and 23·1 of the recovery-houses, while ordinary water closets occurred in 20·6 of the death and 37·3 of the recovery measles houses. While, therefore, the privy midden obtained pretty equally in the death and recovery measles houses, the trough water closet and pail were more common where fatal cases occurred, and the water closet less so. As to water closets themselves, amongst the death-houses the 20·6 per cent. was made up as follows:—Inside closets, with fully ventilated soil-pipe, 2·5; with soil-pipe not fully ventilated 1·8, with water closet outside the house 16·3. Amongst the recovery-houses the corresponding numbers in the same order were 4·1, 4·8, and 28·4.

It is perhaps only fair to remind you that the apparent disadvantage of trough closets, and the advantage of ordinary water closets are probably due to a large extent to the locality. Trough water closets are principally found in the more crowded parts of the city; water closets in the better houses where the ground is more open. In the same way the midden privy obtains largely in the outer districts of the town where, notwithstanding the disadvantage of this form of refuse retainer, other conditions are on the whole favourable. A dirty, overcrowded house, in a close yard, with a water closet, is more likely to come into the death group when measles visits it, than an airy house in an open part of the city, even although the latter should have a midden privy.

SCARLET FEVER.

Time incidence.—In reporting to you on the health of 1891 it was pointed out that the death-rate of Leeds per 1,000 of the population from scarlet fever in the preceding decade (1881-1890) had been given by the Registrar-General as 0·68 against 0·41 for nine years in the large towns. In 1891 the rate for the year was 0·18, the same as that for the 28 large towns, and it varied during the several quarters, chronologically, as follows: 0·20, 0·05, 0·18, and 0·28 per 1,000 of the population per annum. The rate it will be perceived rose towards the end of 1891. During 1892 the average for the year was 0·20, and the annual rates for the several quarters, in time order, 0·16, 0·21, 0·24, and 0·18. The rate for the year in 33 large English towns had been 0·25. It will be noticed that in Leeds, in 1892, the death-rate was highest in the third quarter, when it reached 0·24, after which it fell to 0·18. In the first quarter of 1893, the year we are now considering, the mortality rate fell from 0·18 to 0·05. It was 0·07 for the following six months, rising to 0·13 in the fourth quarter of the year, thus giving an average annual rate for the 52 weeks of 0·08, against a rate in the large towns of 0·29. It will be seen presently, in dealing with the health of districts, that while the rate was a little above our own average in Hunslet and Wortley (0·12 and 0·18), in every district of the city it was below the rate for the 33 large towns.*

Case incidence.—During the year, 339 cases of scarlet fever came to our knowledge — 23 of them through the death returns. Altogether there were 30 deaths, 23 amongst cases we had not previously heard of, 7 amongst those about which we had been already informed. It might therefore be taken for granted, that in the absence of notification, our information about new cases of scarlet fever in the first instance, applied to only one-fourth of the cases in the town. It would not, however, do to multiply the total number of cases heard of by four and say that 1,356 cases positively existed in the town, for a certain number of the 309 non-fatal cases were not heard of at the

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* The city average for the first three quarters of 1894 has been 0·13.

TABLE 12.

Scarlet Fever—Cases and Case-houses. Fifty-two weeks ended December 30th, 1893.

REGISTRATION DISTRICT.	AGES OF CASES.						SEX.		DAYS FROM ATTACK TILL HEARD OF.			AT SCHOOL.	HOUSES.		DENSITY OF POPULATION.		DRAINAGE.														CLOSETS.					
																			INSIDE.								OUTSIDE.				W.C.					
																			SINK.				OTHER.				FALL PIPE.		OTHER.		INSIDE.					
	0–1	1–5	5–15	15–25	25–60	60+	M.	F.	REMOVED.	ILL.	DEAD.		BACK TO BACK. &c.	THROUGH.	INMATES.	ROOMS.	DISCONNECTED.	NOT DISCONNECTED.	T.	C.	T.C	D.	T.	C.	T.C	D.	D.	C.	T.	D.	F.V.	NOT F.V.	OUTSIDE.	T.W.C.	MIDDEN.	PAIL.
COLS. 1	2	3	4	5	6	7	8	9	10 a	10 b	10 c	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
NORTH	..	15	37	9	2	..	34	29	3·4	19·7	16·5	34	44	14	291	165	24	31	29	8	18	..	3	..	5	..	44	8	12	..	1	..	11	17	28	1
WEST	..	13	59	18	3	..	46	47	4·3	25·3	14·0	49	52	30	346	309	37	45	37	4	41	..	..	8	13	..	47	15	4	..	7	12	25	19	19	..
SOUTH-EAST	..	7	24	1	1	..	12	21	4·1	18·4	..	22	24	9	158	93	10	21	18	..	10	3	..	..	2	..	17	3	4	1	1	..	8	12	9	3
HUNSLET	1	9	8	2	..	..	8	12	3·5	16·7	27·0	7	18	1	79	56	5	14	13	..	6	..	6	..	1	..	18	1	3	..	1	1	4	4	9	..
HOLBECK	..	..	3	2	2	..	3	4	2·5	25·3	..	2	4	3	47	27	2	5	5	..	2	..	..	..	..	..	7	..	..	..	..	1	3	2	1	..
WORTLEY	1	14	19	7	..	..	21	20	3·5	27·3	13·0	17	30	11	196	123	18	23	22	3	16	..	1	..	4	..	36	2	..	..	..	3	5	1	32	..
KIRKSTALL	2	8	12	10	1	..	16	17	3·5	30·9	16·3	11	13	19	141	152	20	12	5	..	27	..	2	..	29	..	27	3	5	..	7	7	9	..	9	..
BRAMLEY	..	3	15	..	1	..	6	13	2·6	24·8	19·0	13	15	3	58	41	12	5	5	7	5	..	..	..	2	..	10	1	8	..	2	..	1	..	15	..
CHAPELTOWN	..	6	19	2	3	..	14	16	3·1	38·3	9·0	19	7	23	143	131	13	17	6	2	21	1	3	2	13	..	25	4	2	..	3	11	10	..	6	..
WHITKIRK	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
TOTALS	4	75	196	51	13	..	160	179	3·7	26·5	17·0	174	207	113	1459	1097	141	173	140	24	146	4	15	10	69	..	231	37	38	1	22	35	76	55	128	4

T.—Trapped and then going directly into drain. C.—Cut off over an outside gully. T.C.—Same, plus an inside trap. D:—Directly connected with sewer
F.V.—Soil pipe continued full size above the eaves. T.W.C.—Trough water closet. See note and text.

NOTES TO SCARLET FEVER TABLE.

The information in this table (except under head of density of population) refers to "case-houses," the facts about the same house being repeated for every case which occurred in it.

Duration of illness.—These columns refer to the length of time from the commencement of the symptoms to the date of our first hearing of the case. Columns 10a and 10b refer to patients who were alive at the time the information reached us; 10a to those who afterwards went to hospital, 10b to those who remained at home. Some of these latter were only heard of when the time for disinfecting the house came. Column 10c includes cases heard of in the first instance from the Registrar, and a few who (although reported to us by medical men) had died before the notice reached us. This column therefore does not include all the cases which proved fatal. These will be found in Tables A and C.

Houses.—Column 12 deals with 207 houses, of which 190 were "back-to-backs," 9 "salt-pies," and 8 single houses without apertures in the rear wall. Of the latter 7 occurred in the *Bramley*, and 1 in the *Wortley* district. The "salt-pies" occurred 3 each in *Chapeltown* and *Kirkstall*, and 1 each in the *Wortley*, *West*, and *North* districts. Of the actual houses, as distinguished from the case-houses, 145 were back-to-backs, 7 salt-pies, and 4 single houses without a through draught. The remaining 89 (making up the 245) were through houses.

Density of population.—The number of inmates or rooms is not recounted where a second case occurred in the same house. The figures given deal with 245 houses in which 320 cases occurred.

Drainage disconnection.—(See also explanation p. 61 and p. 74, Annual Report, 1892.) Houses containing w.c., with soil-pipe not properly ventilated, are included amongst those "not disconnected." One hundred and forty-one houses were disconnected, 173 not disconnected, and 6 had no drain. The corresponding actual houses were 111, 131, and 3.

Sink wastes.—Six houses had no sink. Of these, 3 were in the *North*, 2 in the *South-East*, and 1 in the *Bramley* districts.

Other inside drainage.—Every exit of waste water from the house to the drain, other than the sink, is included in these four columns, but many houses had no other inlet to the drain. These columns, consequently, will not balance the number of houses.

Outside drainage.—The last remark also applies to columns 28 and 29. Columns 26 and 27 (fall-pipes) will balance if 6 houses in the *North*, 20 in the *West*, 13 in the *South-East*, 3 in *Wortley*, 2 in *Kirkstall*, 7 in *Bramley*, and 1 in *Chapeltown*, which had no fall-pipe on the house itself, be added. No second fall-pipe in the same house is counted.

Closets.—Nineteen case-houses had 19 extra conveniences; in the *North* district 1 (F.V.) had also an outside water closet. In the *West* district 3 (F.V.) houses, in which 4 cases occurred, had each an extra (F.V) closet. Of 4 houses, corresponding to 5 (not F.V.) case-houses, one had a midden, and 3 others (one of them containing 2 cases) had an extra outside water closet each. In *Hunslet* 1 case-house (F.V.) had also an outside water closet. In *Kirkstall* 1 case-house (entered midden) had also an F.V. inside water closet; another (entered F.V.) had a second F.V. water closet, and 2 others (F.V.) had each an outside water closet in addition. In *Bramley* 1 (F.V.) had also an outside water closet. In *Chapeltown* 1 F.V. and 2 not F.V. had each an additional water closet outside.

commencement of their illness, their names in some cases having come into the zymotic book on our being requested to disinfect the house. It is probably, however, a fair approximation to say that there were something approaching 750 cases of scarlet fever of which we did not hear at the commencement of their illness.

Age mortality.—Of the 30 fatal cases, 10 per cent. were amongst children under one year of age, 57 per cent. were aged from one to five years, 30 per cent. were between five and fifteen, 3 per cent. above fifteen and under twenty-five. There was no death in any of the higher age groups.

Age incidence of attack.—Taking the case incidence, which includes not only the 30 deaths, but all the cases of which we had any information, either during or immediately after the illness, the 339 cases had the following percentages at the several groups of ages:—under one, 1 per cent.; from one to five, 22 per cent.; from five to fifteen, 58 per cent.; fifteen to twenty-five, 15 per cent.; and above twenty-five, 4 per cent. As there were ten recoveries heard of for every fatal case, the age percentages of recoveries do not differ very far from the foregoing. In the same order, for the several periods, they were as follows:—0·3, 18·8, 60·5, 16·2 and 4·2.

It will be noted that while infants under one year of age only formed 1 per cent. of the total cases, and only ⅓ per cent. of the known recoveries, they formed 10 per cent. of the deaths. Children between one and five, who made 22 per cent. of the cases and 19 per cent. of the recoveries, furnished 57 per cent. of the deaths. Children between five and fifteen, practically the school-going age, formed respectively 58 and 61 per cent. of the cases and recoveries, but furnished only 30 per cent. of the deaths. These figures seem to shew that while the greater incidence of scarlet fever was amongst children of the school-going age, the greater proportionate fatality was amongst those of more tender years. Put in another way, of 79 cases heard of in children under five, 20 died—that is a little more than 25 per cent. Of children and others over five, we heard of 260 cases, and there were 10 deaths, or rather under 4 per cent. Notification, it must be remembered, was not at this time compulsory.

Sex incidence.—Of the cases heard of, including the 23 fatal before we knew about them, 160 were of the male and 179 of the female sex, while the deaths were respectively 16 and 14; the mortality having been 10 per cent. amongst boys, and less than 8 per cent. amongst girls.

Time lost before we heard of case.—As already said, 23 patients were dead when information of their attack reached us. Their illness had already commenced on an average 17 days before we heard of it. One hundred and eighty-eight cases were removed to hospital. We heard of these cases at an average of 3·7 days from their attack. The remaining 128 cases, including a few reported to us for purposes of disinfection, had been 26·5 days ill when we first knew about them. As in nearly all the cases removed, the information and the request to remove them came from the medical man, it would seem that something like four days, even in these cases, elapsed between the commencement of the illness and our being able to get the patient into hospital. This seems rather a long interval for a disease generally so easily recognised as scarlet fever.

School attendance.—Excluding 17 cases in public institutions not referable to any dwelling-house in the borough, and 2 as to which the house information is incomplete, there remain 320 cases. Of these 174 (or 54 per cent.) were in attendance at school.

HOUSE CONDITIONS.

With the exception of the information as to density of population, all the house conditions relate to the 320 cases just mentioned. These patients lived in 245 houses. The house conditions are, however, repeated in the table (except in columns 14 and 15) for each case which occurred in the same house.

Through houses, &c.—Of 320 case-houses 113 (or 35 per cent.) were throughs, the remaining 65 per cent. were not (see also note to table 12).

Inmates and rooms.—The 245 houses, in which the 320 cases occurred, had 1,097 rooms and 1,459 inmates. This gives an average of 4·5 rooms, and 6·0 inmates per house. The number of inmates per room was 1·33. At the 1891 census the average occupants per house was 4·7. These figures, however, would be slightly modified if two large houses already referred to, as to which our information is incomplete, were added.

Sink wastes.—Of the 320 case-houses, 6 had no sink; these formed 1·9 per cent. of the whole. There was a direct connection between the sink waste and the drain in 45 per cent. of the case-houses; 1·25 per cent. without, and 43·75 with an inside trap. The sink waste was entirely cut off in 53·1 per cent. of the houses examined; in 45·6 per cent. with, and in 7·5 without an inside trap.

Disconnection of drains.—The information in the previous paragraph deals only with the sink, and only with the sink of the worst form found in the house. If a house had two sinks, one cut off and the other not, the house is entered as not disconnected as to the sink. Some houses, however, had other wastes, and where such wastes were not disconnected, the house was evidently not severed from the sewer. In the same way where an inside water closet had not a fully ventilated soil-pipe, the house is classed as "not disconnected" in table 12, column 17. According to this classification, therefore, 173 of the 320 case-houses examined were not properly severed from the sewer. This amounts to 54 per cent. of the case-houses. If, however, we include the 2 per cent. (1·88) which had no drain, the number of case-houses improperly drained was 56 per cent. We have seen (page 71) that the corresponding figures were 72 and 69 per cent. in the measles death and recovery houses.

Closet accommodation.—Of the 320 houses it is recorded that 41½ per cent. had water closets, inside or out; that 17 per cent. had the use of trough water closets, and 41 per cent. of middens or pails. The following are the more exact percentages:—inside water closets with soil-pipe carried full size above the eaves, 6·88, with soil-pipe not fully ventilated, 10·94; water closets outside the house, 73·76; houses with trough water closets, 17·19; with middens, 40·0; with pails, 1·25.

Houses with more than one case.—The 320 cases, as has been observed, occurred in 245 houses. One hundred and twenty-six cases occurred in 51 houses, in numbers varying from two to five. In 194 houses single cases occurred. In regard to houses with plural cases, the following particulars may be of interest.

In the *North* district there were five such; one with 2, one with 3, and three with 4 patients in each. The house in which the 2 cases occurred was a through house, severed from the drains, and with an outside water closet. The remaining four were all back-to-back houses, two of them were not severed from the drains, and all four had midden privies.

In the *West* district there were fourteen houses in which plural cases occurred; in nine, 2; in one, 3; and in four, 4 cases. Ten of the fourteen were back-to-back houses. Of the through houses, one (with 2 cases) was severed from the drains, and had an F.V. closet inside. Two other throughs (with 2 patients in each) are entered as "not disconnected" from the drains; one had a midden; the other, although its sink was cut off, had an inside water closet, with its soil-pipe imperfectly ventilated. In another through house there were 3 cases, and this house was not properly severed from the sewer, having, like the last, an inside water closet, in which the soil-pipe was not properly treated, but in this case the sink was also connected to the sewer. Four of the ten back-to-back houses had each 4 cases. Three of these four houses were not properly disconnected from the sewer; two had middens; one had a trough water closet. The back-to-back house disconnected from the sewer, in which 4 cases occurred, had an outside water closet. This house contained four rooms—a living room, two bedrooms, and an attic, as well as a scullery. There were 7 inmates—father, mother, and 5 children. A girl of seven was taken ill on the 4th of October, the eruption coming out on the following day. A boy of thirteen was attacked on the 11th of October, and is said to have had no rash at all. A boy of nine was taken ill on the 14th of October. The eruption appeared the same day, and he died on the 17th. A boy of five developed sore throat on the 16th, and is said to have had no rash. The only other child was a boy of five months. It seems not improbable that if the first case had been isolated immediately, the other 3 need not have taken the disease, as a week elapsed between the first and second attacks. There does not seem anything in the structure of the house to account for the number of cases attacked, and the fact that one proved fatal. It is to be regretted that the first case was not removed to hospital as soon as the rash appeared. Of the six back-to-back houses in which 2 cases each occurred four were severed from the drain.

In the *South-East* district there were seven houses with plural cases; six with 2, and one with 3 patients in each. Five of the seven were back-to-back houses. Of these five, one had no drain, but had the use of a trough water closet; one disconnected as to its house drain had an outside water closet; the drains of the other three were not severed from the sewer; one of them had a midden, one a pail closet, and one an outside water closet. The last was the house in which were the 3 patients. Of the two through houses (each with 2 patients) neither was diconnected from the sewer; one had a trough closet, and the other a midden privy.

In *Hunslet* there were 3 second cases in three houses, all of which were back-to-back. All three were not disconnected from the sewer. One of the three had an outside water closet, and the other two rejoiced in midden privies.

In *Holbeck* no second case was discovered in any house reported upon.

In *Wortley* there were seven houses, each with 2 cases, and one with 3. Five of the 2 case-houses were back-to-back; two were through, as was also the house with 3 patients. The latter was disconnected from the sewer, but had a midden privy. The two through houses, with 2 cases each, were not disconnected from the sewer. One of them had an outside water closet, the other a midden privy. Three of the five back-to-backs were disconnected from the sewer, and two were not; all five had midden privies.

In *Kirkstall* there were five houses with plural cases; four throughs and one salt-pie. In four there were 2 cases in each, in the fifth (a through house) there were 3 cases. This house, which was severed from the sewer, had an outside water closet. In the remaining three through houses the drains were not properly severed from the sewer. They had respectively a midden privy, an outside water closet, and an inside water closet, with a soil-pipe only ventilated by the fall-pipe. In other respects this last had its drainage severed. The salt-pie house was disconnected from the sewer, and had an outside water closet.

In *Bramley* a single house, without a through draught, had 5 cases. This house was disconnected from the sewer, and had a midden privy. Three others, two back-to-back and one through, had 2 cases each. The through house was disconnected, and had an inside water closet with properly ventilated soil-pipe. The two back-to-back houses were not disconnected from the sewer, and had midden privies.

In *Chapeltown* there were three houses with 2 cases each; one of them a salt-pie, the other two through houses. Both the latter were disconnected from the sewer, and had the use of trough water closets. The salt-pie is classed as not disconnected from the sewer, having, although its sink was T.C., an inside water closet, with soil-pipe imperfectly ventilated. Two houses, also throughs, had 3 cases in each. One of them was severed from the sewer, the other not. Each had the use of a trough water closet.

DIPHTHERIA AND CROUP.

We heard, during the year, of 78 cases of diphtheria—55 after death. The deaths registered in the city were 59. We heard of no case of croup during life. The deaths, however, of 70 patients were recorded. The houses of 68 of these, and of the 78 reported diphtheria cases were examined in the usual manner. The numbers are too small to make it worth while to place them in an analytical house and case table. In 57 (or 39 per cent.) the drains were in good working order—cut off from the house—and any inside water closet had its soil-pipe fully ventilated. Sixty-one per cent. of the houses examined did not come up to this standard. (See table 25.)

The Registrar-General credits the thirty-three large towns with a death-rate of 0·43 from diphtheria, against an average of

0·21 in the ten previous years. He similarly credits Leeds with a rate of 0·16 as against 0·08 in the decade. I had occasion, on the 7th of February, 1894, in drawing up a memorandum for the Chairman of the Sanitary Committee, to point out that, though the nominal death-rate from diphtheria had considerably increased, the deaths from diphtheria and croup together had not increased in anything like the same proportion. The memorandum* referred to gave the number of deaths and the death-rates in London from diphtheria and croup for each of the years from 1882 to 1892. The returns made to the Registrar-General now include many deaths which would formerly have been classified under the heading of croup. This is merely, after all, an official recognition of a tendency to a greater exactness of diagnosis on the part of medical men that has been going on for a long period.

It is probable, however, that even when all allowance is made for greater accuracy of definition, it will be found there has been, of late years, an increase in the actual number of deaths from diphtheria. This has been pointed out in London and other towns, and it is thought probable that as the increase is most manifest at school-going age, it may be connected with the accumulation of children in larger numbers in our elementary schools. Leeds, fortunately, has suffered to so small an extent from this disease as to make a year's statistics of no very great value. It is possible, however, that at another time I may collect the figures for a period of years, and submit them to you with observations upon the subject. Although the number of deaths is small, the disease is one that might at any time increase. Reference to table 18 will shew that, with a general death-rate of 0·15 from diphtheria, the corresponding mortality was 0·12, 0·20, 0·18, and 0·13 in successive periods of the thirteen weeks, while from croup (including all cases not stated to be spasmodic), with a rate for the year of 0·18, the quarterly rates were 0·14, 0·18, 0·14, and 0·28 respectively.

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* Extract from memorandum in Appendix.

WHOOPING-COUGH.

Whooping-cough is credited with having caused 167 deaths during the year. All but three were those of children below the age of five. This is equivalent to a death-rate at all ages of 0·44 per 1,000 of the population. The mortality in 1891 had been in the four successive quarters 0·35, 0·53, 0·28, and 0·48; an average of 0·41. In the four successive quarters of 1892 it had been 0·75, 0·47, 0·29, and 0·18; an average of 0·42. In 1893 the mortality in the first quarter was 0·23, an appreciable rise upon that of the fourth quarter of 1892. It rose still further to 0·36 in the second, and 0·39 in the third, and ran up in the fourth quarter to 0·78. We offer facilities in every case of whooping-cough that comes to our knowledge for disinfection of the house and garments of the patient and relatives. In every case of death heard of we empty the ashpits and flush the drains. Whooping-cough is a disease in which the tendency is to recovery. Death from whooping-cough is usually an indication of some unhealthy local condition, either of the patient or his surroundings. As will be referred to later on, the death-rate from this cause averaged from nothing in Whitkirk, and 0·14 per 1,000 in Chapeltown, to 0·71 in South-East Leeds and Holbeck. Every house in which death occurred from whooping-cough has been examined by our inspectors, and the general results will be found in table 25. When the number of cases in our books have accumulated to such an extent as to make statistical fallacies less probable, I may take an opportunity of dealing with the results.

Continued Fever.

General incidence.—Continued fevers caused 114 deaths in the year—equivalent to a rate of 0·30 per thousand of the population per annum. In the several quarters the rates were 0·09, 0·08, 0·53, and 0·49 respectively. One death was recorded in the third quarter of the year from typhus. Six deaths, 3 in the first, 2 in the second, and 1 in the fourth quarter, were recorded as due to febricula, or simple continued fever. The remaining 107 were ascribed to typhoid or enteric fever.

TABLE 14.

Typhoid Fever—Cases and Case-houses. Fifty-two weeks ended December 30th, 1893.

REGISTRATION DISTRICT.	AGES OF CASES.						SEX.		DAYS FROM ATTACK TILL HEARD OF.			AT SCHOOL.	HOUSES.		DENSITY OF POPULATION.		DRAINAGE.														CLOSETS.					
	0–1	1–5	5–15	15–25	25–60	60+	M.	F.	REMOVED.	ILL.	DEAD.		BACK TO BACK, &c.	THROUGH.	INMATES.	ROOMS.	DISCONNECTED.	NOT DISCONNECTED.	INSIDE.								OUTSIDE.				W.C.			T.W.C.	MIDDEN.	PAIL.
																			SINK.				OTHER.				FALL PIPE.		OTHER.		INSIDE.		OUTSIDE.			
																			T.	C.	T.C	D.	T.	C.	T.C	D.	D.	C.	T.	D.	F.V.	NOT F.V.				
COLS. 1	2	3	4	5	6	7	8	9	10 a	10 b	10 c	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
NORTH	..	3	12	26	17	..	26	32	6·2	22·2	33·5	9	47	8	277	172	16	38	38	1	15	..	..	..	..	..	35	11	8	..	..	1	13	25	15	1
WEST	..	4	25	30	17	..	29	47	9·9	32·6	34·0	12	54	18	357	252	30	36	33	2	31	..	5	2	3	..	42	16	1	1	4	4	14	21	26	3
SOUTH-EAST	..	2	8	10	8	..	12	16	8·8	19·2	25·3	8	18	9	131	82	12	15	15	..	12	..	..	..	15	..	20	2	2	..	1	3	2	14	4	3
HUNSLET	..	4	29	26	26	..	41	44	11·4	30·1	23·6	22	60	25	336	218	24	61	59	..	26	..	21	..	4	..	77	2	16	1	3	2	13	18	49	..
HOLBECK	..	2	8	6	7	..	8	15	8·9	22·8	26·0	4	15	8	106	75	8	15	15	1	7	..	1	..	2	..	16	6	5	..	2	..	1	5	15	..
WORTLEY	..	3	14	20	28	..	37	28	8·0	16·0	23·8	7	45	20	296	213	19	46	43	1	21	..	2	..	6	..	60	3	2	..	..	4	14	18	29	..
KIRKSTALL	..	..	4	15	11	1	13	18	16·7	28·4	16·0	2	15	16	155	126	12	18	13	..	17	..	6	..	7	..	29	1	5	..	2	5	4	1	19	..
BRAMLEY	..	..	3	3	..	..	2	4	8·0	23·5	20·0	3	5	1	31	21	4	2	1	1	3	1	1	..	..	..	5	1	2	..	..	..	..	..	6	..
CHAPELTOWN	..	..	1	..	1	..	1	1	26·0	..	13·0	..	1	1	13	10	2	..	..	..	2	..	..	..	1	..	2	..	..	..	1	..	1	..	..	..
WHITKIRK	..	..	..	1	..	..	1	..	10·0	..	..	..	..	1	9	4	1	..	..	..	1	..	..	..	..	..	1	..	..	..	..	..	..	..	..	1
TOTALS	..	18	104	137	115	1	170	205	9·5	26·1	25·9	67	260	107	1711	1173	128	231	217	6	135	1	36	2	38	..	287	42	41	2	13	19	62	102	163	8

T.—Trapped and then going directly into drain. C.—Cut off over an outside gully. T.C.—Same, plus an inside trap. D.—Directly connected with sewer
F.V.—Soil pipe continued full size above the eaves. T.W.C.—Trough water closet. See note and text.

NOTES TO TYPHOID TABLE.

The information in this table (except under head of density of population) refers to "case-houses," the facts about the same house being repeated for every case which occurred in it. Of the 375 cases, 5 occurred in public institutions, 2 in hotels or lodging-houses, and the house, where an eighth case occurred, was found closed when our inspector visited. While, therefore, the ages and sexes deal with the full 375 cases heard of, including these 8, and while columns 10 (*a*, *b*, *c*) deal with 373 (information as to previous illness having been obtained in 7 out of the 8 mentioned above, but not having been procured in a case as to which all other required information had been got), the remaining groups of columns (excepting of course 14 and 15) deal with 367 cases or case-houses.

Duration of illness.—This column gives, for each district, the average length of time from the commencement of the symptoms to the date when information of the case reached our office.

Houses.—Column 12 deals with 260 houses, of which 244 were back-to-back, 13 salt-pie, and 3 single houses without aperture in the rear wall. Of the latter, 2 occurred in *Wortley* and 1 in *Bramley*, all "single case-houses." The salt-pies occurred: 2 in the *West*, 4 in the *South-East*, 6 in the *Hunslet*, and 1 in the *Wortley* district. Of the actual houses, as distinguished from the case-houses, 207 were back-to-back, 10 salt-pie and 3 single houses without a through draught. The remaining 86 (making up the 306) were through houses.

Density of population.—The number of inmates or rooms is not recounted where a second case occurred in the same house. The figures given, deal with 306 houses in which 367 cases occurred.

Drainage disconnection.—(See also explanation p. 61 and p. 74, Annual Report, 1892). Houses containing w.c., with soil-pipe not properly ventilated, are included amongst those not disconnected. One hundred and twenty-eight case-houses were disconnected, 231 not disconnected, and 8 had no drain. The corresponding actual houses were 110, 192, and 4.

Sink wastes.—Eight houses had no sink. Of these, 6 were in the *West* and 1 each in the *North* and *Kirkstall* districts.

Other inside drainage.—Every exit of waste water from the house to the drain, other than the sink, is included in these four columns, but many houses had no other inlet to the drain. These columns, consequently, will not balance the number of houses.

Outside drainage.—The last remark also applies to columns 28 and 29. Columns 26 and 27 (fall-pipes) will balance if 9 houses in the *North*, 14 in the *West*, 5 in the *South-East*, 6 in *Hunslet*, 2 in *Wortley*, and 1 each in the *Holbeck* and *Kirkstall* districts, which had no fall-pipes on the house itself, be added. No second fall-pipe on the same house is counted.

Closets.—Each case-house is regarded as having only one closet, the least sanitary one being chosen, as the strength of a chain is that of its weakest link. Fifteen case-houses had 15 extra closets distributed as follows:—F.V. all single case-houses; in the *West district* an extra F.V. in 1 and an extra outside water closet in another: 2 houses with an extra outside water closet in *Kirkstall*, and 1 each in *Holbeck*, *South-East*, and *Chapeltown*. Under heading "not F.V.," 1 two-case-house in the *West* district rejoiced in a midden; 1 two-case-house in Kirkstall had an extra imperfectly-ventilated soil-pipe water closet; a three-case-house in *South-East Leeds* had an extra inside water closet, also with imperfectly ventilated soil-pipe. The remaining single case-house was in *Wortley*; it is entered under midden, and had also an F.V. water closet inside.

ENTERIC OR TYPHOID FEVER.

Time incidence.—The time incidence was practically the same as for continued fever. In the first quarter of the year there were 6 deaths, all in persons over five. In the second quarter there were again 6 deaths, one of them in a child below the age of five. In the third quarter there were 49 deaths, five in children below the age of five, and 44 in persons above that age. In the fourth quarter there were 46 deaths, one of them in a child under five. Altogether of the 107 deaths, 7 were those of children under the age of five.

The death-rate from this disease was equivalent to one of 0·28 per 1,000 of the population. It was 0·06 in the first and second quarters, 0·52 in the third, and 0·48 in the fourth. In 1892 the corresponding numbers had been 0·12 in the first, 0·07 in the second, 0·18 in the third, and 0·27 in the fourth. We suffered therefore rather more in the latter part of the year than we did in the corresponding quarters of 1892. The disease is essentially an autumnal one, and what I have to say in regard to the meteorology of the year under the head of diarrhœa will apply to a large extent to the causation of typhoid * The disease is, however, less quickly terminated than diarrhœa. It is less rapidly fatal, and is longer in its onset, but many of the conditions, meteorological and otherwise, which permit the one, also favour the other.

Age incidence.—The age of greatest mortality in typhoid is very different from that in diarrhœa, measles, or scarlet fever. We have already seen in regard to the two latter, that the mortality was highest before the age of five; in diarrhœa it was highest in the first year of life. In typhoid, on the other hand, out of 375 cases which came to our knowledge, none occurred during the first year of life; between the ages of one to five 4·8 per cent. of the cases heard of occurred; between the ages of five and fifteen, 27·7; between the ages of fifteen and twenty-five, 36·5 per cent.; and between the ages of twenty-five and sixty, 30·7. Above sixty years a single death was registered, nearly equivalent to 0·3 per cent. of all the cases.

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* Pages 96—100.

Taking into account the deaths only, this single death amounted to nearly 1 per cent. of all the fatal cases. At the age periods, twenty-five to sixty, and fifteen to twenty-five, the deaths were at each age group equivalent to 38·3 of the whole mortality. Below that age the deaths of persons from five to fifteen were equivalent to 15·9 per cent., and those from one to five to 6·5 per cent. of the total typhoid mortality. There was neither death nor case heard of amongst infants under one.

It will be noticed in comparing the case and death incidence that the highest case incidence amongst these groups was at the age of early manhood—fifteen to twenty-five. But in the period following—twenty-five to sixty—the cases were fewer. As regards deaths, whilst these gave the highest percentage at the age period, fifteen to twenty-five, they did not diminish at the next period, twenty-five to sixty. The populations at these ages are not, of course, equal. The rates per thousand living at the several age groups would be:—one to five, 0·49 cases and 0·19 deaths; five to fifteen, 1·22 cases, 0·20 deaths; fifteen to twenty-five, 1·76 cases, 0·53 deaths; twenty-five to sixty, 0·77 cases, 0·27 deaths; sixty and upwards, 0·05 cases and 0·05 deaths. Taken in this way, it will be noticed that the case incidence was high after five, highest between fifteen and twenty-five, and then diminished; but the mortality incidence, highest at fifteen to twenty-five, although lower in the next period, was still considerably higher than in the population under fifteen. The numbers are too small to be dealt with in greater detail.

Sex incidence.—Of the cases 170, and of the deaths 52, were those of persons of the male sex. The corresponding numbers of the other sex were 205 and 55. While, therefore, the case incidence was greater, and the number of deaths also greater amongst women, the case mortality was highest amongst men. The latter was 30·6 per cent. against 26·8 for the other sex. The numbers dealt with are, however, small, and as notification was not compulsory, the relationship between cases and deaths may be more or less accidental.

Time lost before we heard of case.—One hundred and eighty-six cases were reported and removed. The average duration of illness before we heard of the case was 9·5 days. This is nearly a day less than the period that elapsed in 1892, and more than two days less than the corresponding period in 1891. This is satisfactory as shewing a tendency on the part of medical men, even before notification came into force, to notify cases for removal earlier than formerly. In 121 cases, where we did not remove the patient, the average duration of illness before we heard of the case was 26·1 days. The corresponding duration of similar cases in 1892 was 24·5, and in 1891 26·5. It is probable that the variation is due to a larger proportion of convalescent cases having been notified to us for disinfection in 1891 and in 1893. Amongst the cases only heard of after death, which formed 66 out of 373, as to which information was complete (or 17·7 per cent.), the duration previous to notification was 25·9 days, against 26·8 in 1892, and 27·8 in 1891. These differences are probably accidental. If they shew anything it is that the cases not reported to us during life died earlier than formerly. The proportion which the cases fatal before notification bore to the whole was 15 per cent. in 1891, 17 per cent. in 1892, and 17·7 per cent. in 1893. The longest duration occurred therefore in the year when the smallest proportion of cases were already dead before we heard of them.

School attendance.—We have seen that 27·7 per cent. of the cases heard of were at the school-going age of five to fifteen. Out of 367 fully investigated, 67 were attending school at the time, or immediately before the time of attack. This is equivalent to 18·2 per cent.

HOUSE CONDITIONS.

Through houses, &c.—Of the 367 case-houses* fully examined, there was a through draught in 29·2 per cent., and there was no through draught in 70·8 per cent.

Inmates and rooms.—The same 367 patients actually lived in 306 houses, containing 1,173 rooms and 1,711 inmates, an average of 3·8 rooms and 5·6 inmates to a house and 1·5 inmates to a room. The number of inmates to a house in the borough at the time of the census was 4·7.

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* See note next page.

Sink wastes.—Eight of the 367 case-houses* had no sink. These formed 2·2 per cent. of the case-houses investigated. Sink wastes were connected to the drain by an S trap in 50·4 per cent. of the case-houses; 8·7 per cent., and probably more, had a box trap in addition. In 0·3 per cent. the connection was without even a trap. Altogether, 59·4 per cent. of the typhoid cases occurred in houses not properly severed from the sewers. On the contrary, 38·4 per cent. had drains cut off outside the house; 36·8 with, 1·6 without, an inside trap. These are the only houses that could be considered as properly treated as to sink wastes. If the 2·2 without sink be added to the 59·4 in which the sink waste was not disconnected, 61·6 of the typhoid cases occurred in houses improperly treated as to sink wastes.

Disconnection of drains.—Amongst the 38·4 per cent. in which the sink waste was properly treated were some case-houses in which other wastes were not thoroughly dealt with, or in which there was an inside water closet, whose soil-pipe was not efficiently ventilated. These reduce the number of houses properly disconnected from the sewer to 34·9 per cent.; those having drains not disconnected become 63 per cent., or, if we add the houses without drains, 65·1 per cent. Roughly speaking, therefore, 65 per cent. of the houses were structurally wrong as to drainage. Out of the 128 case-houses (representing 34·9 per cent.) correctly treated as to disconnection from the sewer, 4 were dirty, 8 were overcrowded, and 12 had midden privies within three yards, reducing the 128 to 104, and the 34·9 per cent. to 28·3, and increasing the 65·1 to nearly 71·7 per cent. in an insanitary state.

Closet accommodation.—Of the case-houses 8·7 per cent. had inside water closets. This includes 3·5 per cent. with closets in which the soil-pipe went, full size, above the eaves, and 5·2 in which the ventilation of the soil-pipe was imperfect. In 16·9 per cent. the houses had outside water closets, making 25·6 per cent. of the typhoid case-houses in which ordinary water closets, either inside or out, were made use of. Another 27·8 had the use of trough closets, 44·4 of middens, and 2·2 of pails.

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* Where case-houses are referred to, the facts relating to the actual house are re-entered for each further case occurring in it.

DIARRHŒA.

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DIARRHŒA.

In the 52 weeks of 1893 608 deaths were registered as due to diarrhœa. During the same period the Registrar-General credited us with 592. These figures correspond to annual death-rates for the whole period on the population estimated to the middle of 1893 of 1·60 and 1·55 per 1,000 respectively. In the rest of this Report, unless otherwise stated, in comparing Leeds with itself, and the various parts of Leeds with themselves, one another, and the whole city, the larger figures will be adopted. In comparing Leeds with other towns, for which we have only the Registrar-General's returns, it will be fairer to compare his figures for Leeds with those he supplies as to other places. In 1892 we classified 411 deaths under this heading. The Registrar-General credited us with 4 less, giving a death-rate of 1·09 per thousand per annum, against an average for the ten preceding years on the Registrar-General's figures of 1·12.

Comparative mortality.—In the Report for 1892, in dealing with this subject, some information (with corrections from subsequent Reports), which had been presented to you at the close of the third quarter, before the Registrar-General's report for that quarter had been published, was laid before you. This dealt with the weeks of highest death-rate in the several Lancashire and Yorkshire towns. The Registrar-General, however, now publishes in his report for the summer quarter tables in regard to the 33 large towns. In one of these he gives the mortality in each of the 33 towns in each of the 13 weeks of the quarter, and in another for the 28 towns for the whole quarter in each of the ten preceding years.

In the 33 large towns the average mortality in the third quarter of 1893 was given by the Registrar-General as 3·5 (3·48) per thousand per annum, and that for the 28 towns in the ten preceding years at 2·5.* The mortality in the large towns had therefore increased from 2·5 in the ten years to 3·5 in 1893, or some 40 per cent. In 67 other large town districts the average annual autumnal diarrhœa rate had been 1·7, and rose last year to 3·8, an increase of nearly 124 per cent.* On the other hand, deducting these two groups of large towns, the rest of England and Wales had a ten years' average of 1·0 per thousand, which rose to 2·1 in 1893, an increase of 110 per cent.; whilst the whole of England and Wales (including both groups of large towns), which had a ten years' average diarrhœal rate of 1·6 and a rate for 1893 of 2·8, manifested an increased mortality from this cause of 75 per cent. It is a little remarkable that the group of largest towns should have had an increase of deaths from diarrhœa considerably less than that in the whole country, and very much less indeed than in the group of towns next to them in size.

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* The five towns added in 1892 were West Ham, Croydon, Swansea, Burnley, and Gateshead, with an aggregate population estimated to the middle of 1893 of 614,616. In these five towns, during the thirteen weeks of the autumn quarter, 578 deaths were registered from diarrhœa, making an annual death-rate for the quarter of 3·77. Deducting the mortality in these towns, the rate for the 28 large towns becomes 3·46

In this connection it may be interesting to note that the 28 towns had a population of nearly ten millions, against a population of nearly thirty millions in the whole of England and Wales, of which they, therefore, approximately constituted a third. If England and Wales had an autumnal diarrhœa death-rate of 1·6 in the ten years 1883-1892, increasing, as just said, to 2·8 in 1893, and the 28 great towns similar rates of 2·5 and 3·5 respectively, then the rest of England, excluding only the 28 towns, would have had death-rates of 1·2 and 2·5. While the 28 large towns increased their death-rates, as just said, 40 per cent., England, less these 28 large towns, had increased its death-rate 108 per cent.†

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instead of 3·48. The difference, however, does not affect the figures when carried only to one place of decimals, and the diarrhœa rate for the third quarter, both in the 28 and the 33 towns may be considered as correctly stated at 3·5.

* Not having the details for the ten years in regard to these other large towns, I assume that, as in the great towns, the alteration in the number of towns dealt with does not greatly affect the proportion.

† A convenient formula for calculating death-rates in the remainder of a district, where only those of the whole district and one of its parts are known, will be found in Public Health for March, 1894, page 184. The rates for England and Wales, less the 28 large towns, have been obtained from the Registrar-General's figures by this method. As the latter are approximations, so are those calculated from them. If carried further, the percentage increase would probably be greater.

In the 33 towns the death-rate from diarrhœa in the autumn quarter ranged from 1·20 in Bristol, 1·53 in Huddersfield, and 1·54 in Halifax, to 6·27 in Wolverhampton, 6·40 in Burnley, 6·86 in Blackburn, 8·43 in Hull, and 9·36 in Preston, and the percentages of increase in the 28 towns from − 9 in London, + 6 in Plymouth, 9 in Brighton, Bristol, and Leicester, and 10 in Norwich, to 150 in Halifax, 176 in Blackburn, and 180 in Hull. Fourteen of the towns with a ten years' autumn diarrhœal rate not exceeding 2·5 had an average increase of 62 per cent., and 14 towns with a ten years' diarrhœal rate of more than 2·5 had an average increase of 68 per cent.

Somewhat curiously the two towns with the lowest decade death-rate, Halifax and Huddersfield, whose rates for the ten years were 0·6 and 0·9 respectively, increased 150 and 67 per cent.; while the two towns with the next lowest decade death-rates, Bristol and Oldham, whose rates for the ten years were 1·1 and 1·4, increased 9 and 114 per cent. respectively. The increase of 150 per cent. in Halifax and 114 per cent. in Oldham still left those towns with rates of 1·54 and 3·01, both of them below the average of the 33 towns.

It may be noted that of the 12 towns with an increase of diarrhœal death-rates in 1893, as compared with their ten years' average, of more than 62 per cent., nine (Huddersfield, Bolton, Sheffield, Manchester, Bradford, Oldham, Halifax, Blackburn, and Hull) were in Lancashire or Yorkshire. The remaining three were Portsmouth, Sunderland, and Wolverhampton. It would therefore seem as if, as a general rule, the increased diarrhœal rate in the large towns had been chiefly in the northern manufacturing counties.

Leicester, Nottingham, and Liverpool, however, had increases of 9, 47, and 47 respectively. The first of these towns is notoriously one in which diarrhœa is usually prevalent. During the ten years its autumn death-rate from this cause averaged 5·4, ranging from 3·6 in 1888 and 3·7 in 1892 to 6·8 in 1887 and 9·4 in 1884. The deaths from this cause, however, have of late years shewn a tendency to decline. The average for the three years, 1890, 1891, and 1892 had been 4·3. The increase from 4·3 to 5·9 is one of 37 per cent., a little below the average increase of the 28 great towns on the ten years' rates. Nottingham, with a decade average of 3 per thousand, had an average diarrhœal rate for the three years, 1890, 1891, and 1892 of 1·7; its increase, therefore, to 4·4 in 1893 was one of nearly 159 per cent. Liverpool, like Nottingham, had a decade record of 3 per thousand, but during the three years, 1890, 1891, and 1892 its average had been 2·17; its rise, therefore, to 4·44 was one of nearly 105 per cent.

Turning in the same report of the Registrar-General's to the actual deaths from diarrhœa occurring in the ten registration divisions of the kingdom, it will be found, on comparing them with the populations enumerated for the same divisions at the census in 1891, that two of these divisions had a death-rate from diarrhœa, estimated upon the 1891 population, of more than 4·4 per thousand. These were the North-Western, which includes Cheshire and Lancashire, and the York Division, which includes the three Ridings in our own county. Next to these came the Northern Division, which includes the counties of Durham, Northumberland, Cumberland, and Westmoreland, with a rate of 3·8, followed by the North-Midland Division, including the counties of Leicester, Rutland, Lincoln, Nottingham, and Derby, with a rate of 3·4. None of the other seven divisions had a death-rate of 3 per thousand from this cause.

Comparing in the North-Western and York Divisions the separate registration counties, it will be found that Cheshire had a rate, on the 1891 population, of 3·4, and Lancashire of 4·7, the West Riding of 4·1, the East of 7·1, and the North of 3·4. These numbers, if calculated upon the population estimated to the middle of 1893, would be somewhat smaller. It is, however, evident that the great divisions, no less than the great towns, shewed a special prevalence of diarrhœa last autumn in the counties of Lancashire and Yorkshire.

Time incidence, &c.—As is usually the case, the mortality from diarrhœa was greatest during the third quarter. On referring to table 17, it will be found that while 11 deaths occurred in the first period of thirteen weeks, and 59 in the second, the deaths in the third quarter amounted to 495, and again fell in the last period of thirteen weeks to 43. These numbers, as will be seen from table 18, correspond to annual rates per 1,000 of the whole population of 0·12, 0·62, 5·20, and 0·45, for the several quarters, and for the whole year, 1·60. This increased prevalence of diarrhœa during the hotter months of the year, as you are aware, occurs not only in England, but in other countries. In the State of New York, about one-third of the deaths from diarrhœa occur in July. There, as in this country, the prevalence is greatest amongst the urban population. If we deal only with the thirteen weeks ended September the 30th, 1893, our annual mortality for that period was at the rate of 5·20 per 1,000 on our own returns, or on those of the Registrar-General, 5·06. For the third quarter of 1892, the Registrar-General's return for Leeds was 3·4, identical with his average for us for the ten years, 1882—91. In 1892, the principal mortality from diarrhœa was in the last week in August. In 1893, although the principal mortality in the 33 towns occurred in the third week of July, several of those towns in the North of England which had a high mortality in the middle of July, had also a considerable mortality at the end of August. The weekly deaths in Leeds, which averaged less than 12 for the year, will be found in table F, but it is perhaps convenient to print some of them here.

TABLE 15 a

Deaths from Diarrhœa, weeks ended

JUNE.				JULY.				AUGUST.					SEPTEMBER.				OCTOBER.			
10	17	24	1	8	15	22	29	5	12	19	26	2	9	16	23	30	7	14	21	28
5	6	8	25	34	61	59	35	34	25	31	54	39	38	33	28	24	8	7	9	7

Our highest mortality a little preceded that of the 33 towns, but like others in the north it again increased towards the end of August. It may be said that our diarrhœa deaths increased suddenly in the last week of June, and decreased suddenly in the first week of October. The deaths in the first three weeks of June, as will be seen above, were below the average of the whole year; the last week of June more than doubled the average, while in the fourteen weeks of which it formed the first, the average weekly number of deaths registered was 37. The last three of these fourteen weeks came below that average, while in the week which followed them (ended October 7th) the diarrhœa deaths fell to 8, and remained below the average of the whole year for the rest of the quarter.

Meteorology.—The meteorological elements most usually associated with diarrhœa are temperature and rainfall. In the third quarter of the five years 1889-1893, the mean temperature in Leeds, as recorded by the Registrar-General in his quarterly reports, was highest in 1893 (59·1° F.), and lowest in 1892 (56·4° F.). In the same five years the rainfall in the third quarter was highest in 1890 (8·57 in.), and lowest in 1889 (5·82 in.). In 1893 it was highest but one (8·15 in.). The average humidity of the atmosphere in the third quarter was lowest (74 per cent. of saturation) in 1891, and highest in 1890 (80%).

The rainfall in the third quarter of 1893 was 8·15in., the humidity 78%, and the mean temperature, as just said, 59·1° F. The mean of the maximum observations of the thermometer was 68·5° F., and of the minimum 53·2°. Though, therefore, the rainfall was by no means scanty and the humidity appreciably above the lowest, the mean temperature was nearly a degree higher than in the third quarter of any other of the five years, while the mean of the maximum temperatures was nearly 3° above that of 1890 (65·9), the next highest, and even more above those of the other three years.

It may, therefore, be considered that the autumn was warm. It will be in the recollection of most of us that it was also dry, notwithstanding the large amount of rain registered. Taking for the same five years the total rainfall in the six months, April to September, it will be found that it was 12·17 in 1889, 13·59 in 1890, 12·20 in 1891, 14·21 in 1892, and 12·66 in 1893. Examining the several months in detail it will be found that in the month of July, 1893, no less than 4·41 inches of rain were registered, very much above the average of the month in any of the other four years. A glance at table F., in the Appendix, will shew that much rain fell in two weeks, the week ended July 8th, when the rainfall amounted to 1·45in., and the week ended August 5th, when it amounted to 2·48 inches. It will be within the recollection of all that in the first week of July the memorable flooding of the river Aire took place. The river rose rapidly during the afternoon and evening of July 2nd, and a great many houses in the lower parts of the town, notably those in Steander Bow and Steander Row, and the houses in the adjacent parts of East Street, were flooded, many of them not only as to the cellars, but the water in some rose several inches above the level of the ground floor. The great rainfall which occasioned this flood ran up our average very considerably in the month of July, and this, along with the considerable fall of rain in the first week of August, raised the average of the quarter.

We have already seen that, when the whole six months are taken into account, the rainfall was only 12·66, the rainfall in the second quarter having been below the average of the other four years. The spring, in fact, so far as that is indicated by humidity of the atmosphere (73 per cent.), had been dry—the driest of the five. It had been not only dry but warm. So far as this is indicated by the mean temperature, it had been also the warmest of the five, the thermometer having averaged quite a degree more during the second quarter than in the second quarter of any of the other four years. The second quarter had also by some three degrees the highest mean of the maximum temperatures of any of the five years, and the average barometric pressure in that second quarter had also been greater than in the corresponding quarter of any of the other four years, although the average of the barometer in the second quarter of 1892 came pretty near.

TABLE 15.

Diarrhœa.—Deaths and Death-houses. Fifty-two weeks ended December 30th, 1893.

REGISTRATION DISTRICT.	AGES OF CASES.						SEX.		DAYS FROM ATTACK TILL HEARD OF.	AT SCHOOL.	HOUSES.		DENSITY OF POPULATION.		DRAINAGE.																CLOSETS.					
																	INSIDE.								OUTSIDE.				W.C.					
																	SINK.				OTHER.				FALL PIPE.		OTHER.		INSIDE.					
	0–1	1–5	5–15	15–25	25–60	60 +	M.	F.			BACK TO BACK, &c.	THROUGH.	INMATES.	ROOMS.	DISCONNECTED.	NOT DISCONNECTED.	T.	C.	T.C	D.	T.	C.	T.C	D.	D.	C.	T.	D.	F.V.	Not F.V.	OUTSIDE.	T.W.C.	MIDDEN.	PAIL.
COLS. 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
NORTH	85	23	..	..	2	4	54	60	19·0	1	101	12	672	361	31	79	78	4	28	..	2	..	1	..	65	15	7	..	..	1	21	49	39	3
WEST	76	23	..	..	4	12	59	56	18·4	1	79	35	637	446	43	71	67	5	41	1	3	..	4	..	76	16	12	..	4	9	34	36	29	2
SOUTH-EAST	53	12	..	..	3	..	37	31	15·8	..	60	8	366	194	28	38	37	4	24	1	1	..	2	..	44	11	4	..	1	..	11	36	13	7
HUNSLET	96	11	2	1	2	2	61	53	16·3	1	98	16	634	346	38	75	74	1	37	1	8	..	1	..	106	8	14	..	1	..	10	33	69	1
HOLBECK	37	12	..	..	1	2	30	22	13·3	..	41	11	259	143	17	34	31	4	13	3	..	..	..	..	36	8	5	..	..	..	9	24	19	..
WORTLEY	47	9	1	..	5	7	38	31	19·5	1	53	15	364	235	15	51	49	..	16	1	1	..	..	..	59	5	1	..	..	1	12	10	45	..
KIRKSTALL	33	6	..	..	1	2	24	18	17·7	..	28	14	232	169	17	23	22	..	18	..	..	..	8	..	38	1	6	..	1	1	13	5	22	..
BRAMLEY	15	3	..	..	..	1	6	13	23·1	..	17	2	102	66	9	8	8	..	9	..	..	..	..	..	17	1	2	..	1	..	..	..	18	..
CHAPELTOWN	11	..	..	..	1	3	4	11	13·5	..	5	10	83	81	8	7	7	1	7	..	2	..	5	..	10	3	4	..	2	1	6	1	5	..
WHITKIRK	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
TOTALS	453	99	3	1	19	33	313	295	17·5	4	482	123	3349	2041	206	386	373	19	193	7	17	..	21	..	451	68	55	..	10	13	116	194	259	13

T.—Trapped and then going directly into drain. C.—Cut off over an outside gully. T.C.—Same, plus an inside trap. D.—Directly connected with sewer
F.V.—Soil pipe continued full size above the eaves. T.W.C.—Trough water closet. See note and text.

Notes to Diarrhœa Table.

The information in this table (except under head of density of population) refers to "death-houses," the facts about the same house being repeated for every fatal case which occurred in it.

Age and sex.—Further information as to both these matters will be found in the text. The figures in the table deal with 608 deaths registered.

Duration of illness.—This column gives, for each district, the average length of time from the commencement of the symptoms to the date when information of the death reached our office.

Houses.—Column 12 deals with 482 houses, of which 454 were back-to-backs, 20 "salt pies," and 8 single houses without apertures in the rear wall. Of the latter, 4 occurred in *Bramley*, 3 in *Wortley*, and 1 in *Holbeck*, all "single-death" houses. The salt-pies occurred : 5 in the *North*, 5 in *Wortley*, 4 in South-East, 4 in *Hunslet*, 1 in the *West*, and 1 in *Holbeck* district. In this case also the 20 death-houses mean 20 separate dwellings. The 454 deaths which occurred in back-to-back houses took place in 445 separate dwellings. In the *North* district there was a second case in one house ; in the *West*, another ; in the *South-East* district, in each of two houses, there was a second case ; in *Hunslet* the same ; in *Holbeck*, in one house, there was a second case ; in *Wortley* and *Kirkstall* the same. In 122 through houses there were 123 deaths, two having occurred in one house in the *Wortley* district

Density of population.—The number of inmates or rooms is not recounted where a second case occurred in the same house. The figures given deal with 595 houses in which 605 deaths occurred. (See House conditions text, page 105.)

Drainage disconnection.—(See also explanation p. 61 and p. 74, Annual Report, 1892.) Houses containing w.c., with soil-pipe not properly ventilated, are included amongst those not disconnected. Two hundred and six death-houses were disconnected, 386 not disconnected, and 13 had no drain. The 206 deaths in disconnected houses occurred in 205 dwellings, a second death in the *South-East* district having occurred in a house cut-off from the sewer, but with a dirty midden privy eight yards away. Three hundred and eighty-six deaths, in houses not disconnected, occurred in 377 houses, single second cases having occurred in the *North*, *West*, *South-East*, *Holbeck*, and *Kirkstall* districts ; second cases in two houses each in the *Hunslet* and *Wortley* districts.

Sink wastes.—Thirteen houses had no sink. Of these 3 were in the *North*, 2 in the *South-East*, 1 in *Hunslet*, 1 in *Holbeck*, 2 in *Wortley*, 2 in *Kirkstall*, and 2 in the *Bramley* district. No second death from diarrhœa occurred in any of these thirteen houses. Death-houses 605, actual 595. (See page 105.)

Other inside drainage.—Every exit of waste water from the house to the drain, other than the sink, is included in these four columns, but many houses had no other inlet to the drain. These columns, consequently, will not balance the number of houses.

Outside drainage.—The last remark also applies to columns 28 and 29. Columns 26 and 27 (fall-pipes) will balance if 33 houses in the *North*, 22 in the *West*, 13 in the *South-East*, 8 in *Holbeck*, 4 in *Wortley*, 3 in *Kirkstall*, 1 in *Bramley*, and 2 in *Chapeltown*, which had no fall-pipe on the house itself, be added. No second fall-pipe on the same house is counted.

Closets.—Nine death-houses had 10 extra conveniences ; one in the *North* district (entered not F.V.) had an additional water closet, soil-pipe also not properly ventilated, and a trough water closet outside the house. Another house in the *North* district had two outside water closets. In the *West* district a house (with a water closet F.V.) had a second similar convenience, and another house (with a water closet not F.V.) had a pail closet in addition. In *Wortley*, a house in which two patients died, had a water closet in the bath room (F.V.) and a midden outside, one yard distant. The house, which counts two in the table, is entered under the heading M. In *Kirkstall*, a house (entered F.V.) had a second closet (outside) ; while in *Chapeltown*, a house (entered F.V.) had an outside closet. and another (entered M) had an F.V. closet. In the table itself the houses are entered under the heading of the most objectionable form of convenience. Further information will be found in the text.

It is therefore quite as much to the meteorological conditions of the second quarter as to those of the third that we have to look for the physical factors which favoured an outbreak of diarrhœa. Briefly stated, they are somewhat as follows. The early spring was exceedingly dry, its temperature above the average, the moisture in the atmosphere less, and the condition of anti-cyclone frequent. Although a heavy rainfall occurred in July, and also in August this did not greatly increase the moisture in the air in the third quarter, the mean temperature of which was above the average of recent years, and there was especially a high day temperature. While, therefore, the natural flushing of the drains in July and August was considerable, it was not persistent, and was attended by many of the disadvantages of too sudden a rainfall, such as the silting up of some drains and the flooding of basements, not only in the places mentioned, but in other parts of the town, where the size of the sewers was not sufficient to meet the sudden emergency. A list of houses thus flooded was presented to the Sanitary Committee at their July meeting. Persistent high temperature favours the growth of bacterial organisms in ashplaces and traps, and great stillness of the atmosphere keeps them near the place of their nativity.*

Age incidence.—As in previous years, the deaths from this cause were chiefly amongst very young children. Of 608 in the year, 453 (or 74·5 per cent.) were those of infants under 12 months, 84 (or 13·8 per cent.) of children between 12 and 24 months, and 15 (or 2·5 per cent.) of such as had attained their second but not completed their fifth year. Put in another way, 75 per cent. of all the deaths were those of infants under 1, 88 per cent. of children under 2, and 91 per cent. of children under 5. The first twelvemonth of life was, therefore, again the most fatal.

In 1892, 73 per cent. of all deaths had been in infants under 1, 92 in those under 2, and 95 in those under 5. Compared, therefore, with the total mortality from diarrhœa, the deaths under 1 were proportionately more numerous in 1893 than in 1892, but those between 1 and 5 bore a higher proportion to the total mortality in 1892 than in 1893.

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* The average observed barometric pressure (uncorrected) was 29·76 inches. The thermometer was below the average of the quarter in the second and third weeks of July and the first week in August, and in the last and last week but one in September. In the rest of the quarter the movement of the air was slight.

It has to be remembered that the population at these ages is liable to considerable variation. In 1892, more particularly in its third quarter, diarrhœa lessened considerably the number of those living under 5 ; its effect having been chiefly upon the number of infants under 1, the number of survivors, who should appear as children between 1 and 2 in the year 1893, was thereby lessened. Similarly in the fourth quarter of 1892, and the first and second quarters of 1893, measles had been very fatal amongst young children, more especially amongst those who had completed their first, but not their fifth year. More than two-fifths (123) of the 297 deaths in those three quarters occurred amongst children who had completed the first but not the second year of life, and two-sevenths (86) amongst those between 2 and 5. It is evident, therefore, that when, in the autumn of 1893, diarrhœa again became specially fatal amongst the younger members of the community, there would be a somewhat smaller proportion of children between 1 and 5 available for attack than would have been the case had the mortality in the previous fifteen months been less amongst young children. Many infants under 1 living in the autumn of 1893, however, had been born subsequently to the prevalence of the autumnal diarrhœa of the previous year, and had escaped measles in the earlier parts of 1893, which attacked chiefly those a little older. So that, from these exceptional circumstances, there was a larger proportion than usual of children at the earlier age group.

If. instead of dealing with diarrhœa deaths in the whole year, we restrict ourselves to those registered in the third quarter, we get a probably more accurate idea of the age incidence of the epidemic disease. For this purpose 25 deaths which occurred in the last week of the second quarter* have been added, making the period dealt with one of 14 weeks. During this period there were 520 deaths.* Of these 397 occurred during the first year of life, 71 during the second, 10 during the third, none during the fourth and fifth, 4 during the age period 5 to 25, 12 between 25 and 60, and 26 above that age. These 26 deaths were distributed as follows: 60 to 65, six; 65 to 70, six; 70 to 75, eight; 75 to 80, two; 80 to 85, four.

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* These 25 deaths occurred as to age as follows : 7 under three months, 6 between three and six, 8 between six and nine, and 2 between nine and twelve months ; during the second year of life none, and 1 in the third year. The only other death from diarrhœa that week occurred in a man of 61.

The first year of life, therefore, contributed 76 per cent., the second nearly 14 per cent.; together, 90 per cent. The third year of life less than 2 per cent. From the third to the sixtieth year the deaths formed 3 per cent. of the whole, and above the sixtieth year 5 per cent. Dividing the 76 per cent. according as the deaths occurred amongst infants under three months, three to six, six to nine, and nine to twelve months, the percentages upon the whole mortality are as follows: 19·8, 26·0, 17·9, and 12·7.† The smallest number of deaths at any of these periods was at that from nine to twelve months. Even this smallest trimestrial period, however, came nearly up to that of the whole of the following year. The greater death-rate in the second three-monthly period is remarkable. A third of the deaths in infants under one occurred amongst those from three to six months of age.

Presumably the majority of the deaths in the autumn quarter amongst children more than three but less than six months old occurred amongst those born in the first quarter of the same year. The births in that period were 3,145. In the second quarter they were 3,235, a little in excess; whereas in in the third quarter they fell to 3,071. While, probably, the greater part of the population aged between three and six

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[*] Making for the 14 week period an annual rate of 5·07. The rate for the quarter on 495 deaths, estimated in the usual way for the 13 weeks, was 5·20, the average number of deaths per week being 38. The 25 deaths, however, which belong to the epidemic period are added above to get larger data for calculating the proportions at various ages.

[†] The deaths of infants under one at these four three-monthly periods were 103, 135, 93, and 66, or 25·95, 34·00, 23·43, and 16·62 per cent. of the whole 397.

months in the third quarter would consist of the survivors of the 3,145 children born in the first quarter, a few might belong to the 3,235 born in the second. On the other hand, the children of less than three months would have most of them been born in the second quarter of the year. None of them could have been born earlier, but some might have been born in the third quarter, when, as just said, there were 3,071 births. So far as these figures go they would rather tend to shew a probability that if the disease attacked children at these different ages in proportion to their numbers, there might be a greater mortality at the period from three to six months than in that below three.

Again, dealing with those whose age was between six and nine months, they would be chiefly selected from those born in the fourth quarter of 1892, when there were 3,061 births. Some of them would be children born in the first quarter of 1893, but none could have been born previously to the fourth quarter of 1892, so that the population at this age, again judged merely from the births, would be smaller than at either of the earlier periods. Children aged nine to twelve months, in the third quarter of 1893, would have been principally born in the third quarter of 1892, though some might have been born in the fourth. The births in the third quarter of 1892 were higher than any of those already given, but those in the fourth were fewest. So far as births were concerned, the population amongst which the deaths at this age occurred might, therefore, be greater than the available populations under three months and from six to nine months, but smaller than that from three to six months.

It has, however, to be remembered that the children born in the third quarter of 1892 suffered, as has been already said, from the diarrhœal outbreak of that year, and to some extent from measles in the first and second quarters of 1893, all these causes tending to lessen the population at this age in the third quarter of 1893. But even when allowance is made for all these circumstances, it seems remarkable that the diarrhœal death-rate should have been so high in the age period of more than three and less than six months. Compared with the one just spoken of (that between nine and twelve months), the deaths (135) were a little more than double, and even counting births in the contributing quarters, the rate of mortality was one-half more. We shall see later (page 116) that probably upwards of 80 per cent. of these children had recently been either wholly or partly weaned.

Sex incidence.—Of the 608 deaths in the 52 weeks 313 were amongst persons of the male and 295 of the female sex, or in the proportion of 1,064 of the former to 1,000 of the latter. In the fourteen weeks dealt with* the proportion was practically the same, 268 of the male and 252 of the female sex, or in the proportion of 1,063 of the former to 1,000 of the latter. Confining our attention entirely to the 478 deaths amongst children under three (there having been as already said no deaths in the age period from three to five) the proportions are as follows: 250 boys to 228 girls, or as 1,096 to 1,000. It is evident, therefore, that in early life boys suffered in larger numbers than girls. There were, however, at the time of the census in 1891, actually more girls living in Leeds under the age of three than boys. The numbers recorded were—boys 14,013, girls 14,509.

If the proportion between the sexes at this age remained the same in the middle of 1893, and if the population at this age might be supposed to have increased since the census at the same rate at which the population at all ages had increased from 1881 to 1891, the annual death-rate per thousand of this population for the fourteen weeks for both sexes would be 60·08; for boys it would be 63·95, and for girls 56·33. On this supposition, for every thousand girls who died of diarrhœa in these fourteen weeks out of a given number of the same age and sex, there would have been out of the same given number 1,135 boys. Boys, therefore, not only suffered actually to a larger extent than girls, but if the population of the two sexes bears the same ratio as it did at the last census, to a considerably greater extent than the actual figures would at first lead one to suppose.

Time lost before we heard of case.—Our information is again almost entirely from the death-returns. Neglecting three cases,

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* Thirteen weeks of the autumn quarter and the preceding week. See pp. 101, 102.

Z 1281-4, Z 1317-5, and Z 1388-8, about which exact information as to the commencement of the illness could not be obtained, the average interval in the remaining 605, between the attack and the date when information of the death reached us, was 17½ days. Last year it was 19½. The time that elapsed before we heard of the case varied from 13·3 and 13·5 days in Holbeck and Chapeltown to 23 days in Bramley. It was below the average of the borough in Holbeck, Chapeltown, South-East Leeds, and Hunslet, and above it in all the other districts. Last year the length of time that elapsed was 10 days in Chapeltown and nearly 26½ in South-East Leeds. As pointed out in the report for that year (p. 71) the delay in our receiving information is important, as it retards the measures that we take to remove the causes of the endemic.

School attendance.—Four only of the 608 cases were in attendance upon school. As already pointed out, the greater number of the deaths occurred amongst children under three years of age.

HOUSE CONDITIONS.

Under the last heading but one we dealt with the time before we learned of the illness of 605 patients out of the 608 whose deaths were registered in the 52 weeks. The 605 include three deaths in public institutions—Z 1379:3 in the Leeds Union Workhouse; Z 1358:6 in that of Bramley; and Z 1308:4 in the Little Sisters' Home (West Reg. District). The house conditions in regard to public institutions we have generally omitted, as throwing little or no light upon the local causes of disease. These three cases do not therefore appear in the part of the table containing information about the air-space, house drainage, and closet accommodation. On the other hand, the house conditions of the three persons, the duration of whose illness could not be obtained, are included in columns 12—35 in the table dealing with them. Though in all three cases the house was empty, it was still examined and the number of occupants has been ascertained from the neighbours. We thus deal, as just said, with houses in which 605 of the 608 patients died from diarrhœa, but the 605 deaths are not, as to three of them, those of the same persons dealt with in column 10.

Through houses, &c.—In these cases we have counted each house in which a death occurred as many times as there were deaths in it from the same disease during the year. Of the 605 deaths, therefore, 454 occurred in back-to-back houses, 20 in salt-pies, and 8 in other houses not back-to-back, but which had not a through draught, and 123 in houses which had.* Altogether there were 482 houses reported on examination as without a through draught. It would seem, therefore, that 79·8 per cent. of the fatal cases were attacked in houses without a through draught.

Inmates and rooms.—The 605 patients died in 595 houses, containing 2,041 rooms and 3,349 inmates, including the patients. These figures give an average of 3·4 rooms and 5·6 inmates to a house, and 1·6 inmates to a room.† At the time of the census the average number of inmates to a house was 4·7 for the borough.‡

The number of persons to a house or tenement was thus 19 per cent. in excess in the diarrhœa houses in 1893 over the average number found throughout the borough at the time of the census. This 19 per cent. is probably an under-statement as to the crowding which existed in houses in which deaths were registered from diarrhœa. Statistics as to the number of persons to a house obtained by our inspectors, both in investigating the number of persons in the Insanitary Area No. 1, and, so far as they are yet tabulated, in their house-to-house work, have been always below the numbers enumerated by the census officials. This is easily understood when we remember that the census is compulsory, and is made on one particular night. The questions are answered to us voluntarily, and the answers in most cases will refer only to the usual population in the house. The floating population would be to a large extent uncounted by us, though it would be included in the one-night enumeration of the census. This matter, and the proportion of houses of different sizes in which diarrhœa deaths occurred, is referred to a little later, when dealing with the causes of the disease (page 110).

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* A few of these might be actually back-to-back houses with a side door, but such, if any, have been counted here as elsewhere in the report, as through houses.

† Leaving out a six-roomed lodging-house registered for 52 occupants, and counted as having that number of inmates, the second decimal place would be altered but not the first.

‡ More exactly 4·71; or, if we count tenements instead of houses, 4·66.

Sink wastes.—Of 605 "death houses," 592 had sinks. Of the 592 with sinks, the waste-pipe in 7 went directly to the sewer, and in 373 some form of trap was interposed. In 380 out of the 592 (or 64·2 per cent.) the sink waste was not completely severed from the sewer. In 295 there was an S trap under the sink stone, in 73 it was ascertained that there was a box trap in the cellar as well, in 5 there was a box trap without the S trap, and in 7, as already said, there was no trap at all.

So far as the sink-pipe was concerned, 212 of the 592 (or 35·8 per cent.) had the sink waste severed from the sewer, most of these at the level of the ground floor. Of these, 193 had an S trap underneath the sink before the waste left the house. In 19 the waste went to the trap outside without such interference.

Thirteen houses had no sink at all. As these 13 are also recorded as having no drains whatever inside the house, they come, strictly speaking, under a separate category. The absence of a sink is regarded as, on the whole, a disadvantage; it implies generally the absence of any water supply in the house. It means usually the retention in pails and sundry vessels of washing water and other slops for a considerable length of time, until it is convenient to carry them outside the house. It is, therefore, probable that, in most cases, and under otherwise similar conditions, such houses are less healthy than those in which a properly arranged system of sink waste exists. That is to say, a system by which the waste-pipe is reduced to the shortest possible; is carried out of the house; discharges into the open air some few inches away from a small gully which is washed by the fall water from the roof.

Other inside drainage.—In these 592 "death-houses" with sinks, there were altogether 38 other drains (not necessarily in separate houses), of which 21 were disconnected from the sewer and 17 not. In two of the houses, in which the sink waste had been treated by being carried outside over a gully, there were other drains in the basement not disconnected from the sewer. One of these was in the North Registration District (Z 1307-8). The house where the patient died was an inn. There was a gully trap in the basement, a nuisance common in houses of this sort. The other patient died in the West Registration District (Z 1345-8). The house, a back-to-back one with three rooms, contained a disconnected sink on the ground floor (T.C.), a bath (T.C.), and a trapped gully in the cellar. There was also an offensive midden within one yard of the house. The drainage of this house is mentioned in another part of the report (page 116). It has been tested from an outside fall-pipe, and the smell of the test penetrated into the house.

Fallpipes.—In 451 "death houses" there were one or more fall-pipes going directly to the drains, and in 68 all the fall-pipes connected with the house were cut off from the sewer. In 86 "death houses" there was no fall-pipe on the house itself.

Other outside drainage.—Fifty-five houses were provided with other drains outside the house, not including the gully trap belonging solely to the sink. These connections were all trapped, and were principally yard gullies intended for the reception of slops, and their distance from the house varied considerably.

Closet accommodation.—Of the 605 "death-houses," 139 (or 23·0 per cent.) had the use of some form of ordinary water closet, and 194 (or 32·1 per cent.) had the use of trough water closets; while 272 (or 44·9 per cent.) made use of midden or pail. These figures include nine "death-houses" in which there was extra closet accommodation. Six of these are included in the 139 with water closets. Of these six, four had additional water closets, and one house had not only an additional water closet, but also a trough closet, and the sixth had a pail. The remaining three "death-houses" are included in the table amongst those having middens. Two of them were really the same house, two deaths having occurred in it. It had a midden outside, and a fully ventilated water closet inside. The third had also a fully ventilated water closet inside. These nine "death-houses," using these ten extra closets, are in the table in each case classified according to the form of closet least sanitary.

Of all the forms of closets tabled, the water closet outside the house is probably usually the least objectionable. Then comes, from a sanitary point of view, the inside water closet (F.V.), in which the soil-pipe is fully ventilated. If a house had any of these, and also a midden, the death would have been entered as having occurred in a house with the latter. On the other hand, if a house had the use of a midden or a trough closet, and in addition had an inside water closet in which the fall-pipe took the place of a proper soil-pipe ventilator, or in which there was no soil-pipe ventilator of any kind, or in which there was a ventilator smaller than the diameter of the soil-pipe, this would be looked upon as ordinarily a more objectionable form of closet than the midden or the trough closet. There were thirteen "death-houses" in which there was an inside closet thus imperfectly ventilated. Twelve of these had no other closet accommodation. In one, as already mentioned, there was also a pail. All these thirteen houses are regarded as not properly severed from the sewers.

In some respects it might be convenient, having regard only to closet accommodation, to increase the "death-houses" by 10, in which case the 139 water closet houses would become 147, of which the 10 with the soil-pipe fully ventilated would become 14, the 13 with the soil-pipe not fully ventilated would become 14, and the 116 outside closets would become 119. In the same way the 194 trough closets would become 195; while the 259 houses using middens would remain the same, the 13 using pails would become 14, making in all 615 instead of 605. The percentages upon the 615 would be as follows: Inside water closets F.V. 2·3, not F.V. 2·3; outside water closets 19·3; trough water closets 31·7; middens

42·1 ; and pails 2·3. Leaving out these ten extra closets, as is done in the table, the percentages are as follows: Inside water closets, F.V. 1·7, not F.V. 2·1 ; outside water closets, 19·2; trough water closets, 32·1 ; middens, 42·8 ; and pails, 2·1.

CAUSATION.

The importance of a cause of death to which was attributed nearly 22 per cent. of the whole mortality in the autumn quarter is so great that I may be pardoned for dealing somewhat fully with the conditions accompanying it. Some of these have already been dealt with, but some, not gone into in former reports, were specially investigated last year on account of the seriousness of the outbreak.

Overcrowding.—We have already seen that the houses in which diarrhœa was fatal had an average of 19 per cent. more inmates than were found at the time of the census in the borough. These numbers, however, deal with cases of diarrhœa throughout the whole year, and it has been thought better in other parts of the Report to take into consideration the fourteen autumn weeks when diarrhœa was more specially prevalent. In these weeks we have seen there were 520 deaths. Omitting 2, which occurred in public institutions, the remaining 518 occurred in 509 houses or tenements.*

These 509 tenements included 6 containing only one room each, with an average population per room and per house of 3·3. In the borough, at the time of the census, the average population of one-roomed dwellings was 2·8. In 136 two-roomed tenements there lived 649 inmates (including the patients); an average of 2·4 persons per room and 4·8 per house. In the borough the corresponding averages were 1·8 and 3·6. In 195 houses there were three rooms, with an average number of inmates per room of 1·8 and per house of 5·5. The three-roomed dwellings at the census averaged 1·5 inmates per room and 4·4 per house. There were 87 houses with four rooms each, containing altogether 508 occupants, an average of 1·5 per room and 5·8 per house. At the census the four-roomed houses had an average of 1·2 per room and 4·8 per house. The remaining 85 houses, each containing five rooms and upwards, had 481 inmates and 525 rooms, an average of 0·9 persons per room and 5·7 per house. The number of rooms in houses containing five apartments and upwards at the time of the census has not been published, but the number of persons in houses with more than four rooms averaged 5·4.

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* These 509 houses contained 2,733 inmates, an average of 5·37 per house, against 4·66 in the borough at the census. The houses in which fatal diarrhœa occurred during these weeks had, therefore, 15 per cent. more inmates than were found in houses generally at the census.

It would seem, therefore, as if in every class of house the number of persons in those where diarrhœa was fatal had been greater than in the same class of house at the time of the census, and if the remark made at page 106 be justified the difference might possibly in some cases be even much greater than these figures imply.*

In the six one-roomed dwellings (fortunately only a little over a thousand of this class exist in the borough) the number of occupants was something like 18 per cent. in excess of those found in the smaller dwellings at the census, but the proportion which this class of diarrhœa house in the fourteen weeks bore to the total tenements was very little different from that found at the census. In regard to two-roomed houses there would appear to have been 33 per cent. more people per house than were estimated to occupy the same class at the census. These houses, at the census, formed nearly 18 per cent. of all dwellings in the town, but they formed nearly 27 per cent. of the 509 diarrhœa houses. Three-roomed dwellings formed nearly 22 per cent. of all the tenements in Leeds in 1891, but they formed 38 per cent. of the 509 houses we are now considering, and the number of occupants in these diarrhœa houses was 25 per cent in excess of the number found in houses of similar size at the census. Four-roomed houses, which formed nearly 26 per cent. of all the dwellings in Leeds in 1891, constituted only a little more than 17 per cent. of those in which fatal diarrhœa occurred in the fourteen weeks; but these diarrhœa houses contained nearly 22 per cent. more occupants than the corresponding houses at the census. On the other hand, houses which had five rooms, or more than five, and which constituted at the time of the census 33·4 per cent. of the houses in Leeds, formed exactly half that percentage (16·7) of the diarrhœa houses in the fourteen weeks, and these contained only 5 per cent. more occupants per house than obtained at the time of the census.

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* There is another possible fallacy here. Our inspectors are directed to count only habitable rooms, not coal cellars, box rooms, wash kitchens, keeping cellars, or sculleries. There seemed a doubt in the minds of some of our staff, who acted as enumerators at the census, as to what the Registrar wished them to count as a room.

It would therefore seem that fatal diarrhœa occurred disproportionately in the smaller dwellings, and that amongst these it selected as a rule those most crowded.

Employment of mothers.—It has been frequently remarked that the cotton and lace making towns, where women are much employed, have usually a very high infantile mortality. It is, therefore, worth while to inquire in regard to Leeds whether any and, if so, what proportion of the deaths from diarrhœa were attributable to this cause.

Out of 520 deaths from this complaint in the fourteen weeks during which diarrhœa was most fatal, we have already seen that 478 were those of children under three years of age. It was ascertained that in 35 amongst these fatal cases* the mother was engaged in some employment away from home, and that in 4 others she did work, other than household work, at home. In 19 other cases there was no mother in the house although in one case there was a housekeeper not otherwise employed. In 13 the child was out at nurse, and as to 19 no information about the mother has been entered up, but the child's name differed from that of the householder.

Under the age of three months there were (in the 14 weeks) altogether 103 deaths. Amongst these, as to 5, it was ascertained that the mother worked away from home, in 3 others the child was out at nurse, and about 2 our information was incomplete, but the name of the child differed from that of the householder. Rejecting these 2 doubtful cases there remain 101 infants under three months, and of these 8 might be regarded as likely to suffer from the want of mother's care. Between the ages of three and six months 135 infants died. Rejecting 7, as to whom the record was incomplete, we have 128 left. Of these the mothers of 10 worked away from home, and those of 2 others took in work, making together 9 per cent. To these must be added 7 cases in which there was either no mother, or the child had been put out to nurse, making together nearly 15 per cent. of the infants between three and six months who possibly suffered from the want of maternal care. Between six and nine months there were 93 deaths. From these, deducting 6, imperfectly recorded, amongst the remaining 87, the mothers of 9 worked away from home, 1 at home, 2 had no mother, and a third was a nursed case. Thirteen out of the 87, or nearly 15 per cent., lay under this kind of disadvantage. Between nine months and twelve there were 66 deaths from diarrhœa in the fourteen weeks. The mothers of 5 of the 66 cases worked away from home, and of a sixth at home, while a seventh child was out at nurse. These accounted for 11 per cent. of the cases. Between one year and two there were 71 deaths. The circumstances as to parentage of 4 of these were imperfectly recorded. Two were out at nurse, 2 had no mother, while in 4 cases the mother worked out. These 8 form nearly 12 per cent. of the 67. Above two and under three years of age there occurred 10 deaths. In 2 cases the mother worked away from home.

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* The information in our books refers to diarrhœa (as also to certain other zymotic deaths) throughout the year, but it has only been analysed for the purpose of this portion of the report in regard to the fourteen weeks during which diarrhœa assumed a somewhat epidemic character.

Classed together, all the children under one amount, after making deductions for certain not fully entered up, to 382. It will be found that altogether 8 per cent of these deaths occurred amongst children whose mothers were working away from home, 1 per cent. more where the mother took in work at home, in another 1 per cent. there was no mother, while in nearly 3 per cent. the child was out at nurse. Altogether, in 13 per cent. of the cases fairly entered up, the child was in some way and to some extent deprived of its natural protector. This is probably an under-statement, because the 15 cases deducted are all cases in which the name of the child differed from that of the occupier of the house. Were these 15 cases added to the total deaths and to the motherless children the proportion would be nearer 16 per cent.

It is difficult to give anything very much more exact, as the inquiry was not instituted with the special object of obtaining this information. In every case of zymotic disease inquired into, the inspector is asked to obtain the ages of the children and the approximate ages of those in adult life, with the several schools or places of employment at which they are engaged. The primary object of this is to enable us to trace infection not only from family to family, but from school or workshop to family, and the information has often proved of great value. The category of working age, "over 15," is, however, too vague for us in every case to identify the mother of the child, and in some cases, where the ages are given more accurately, the relationship to the child is not stated. The information lacking to complete the record refers almost entirely to cases investigated by inspectors who have since left the town. Even were this present, there might still be cases omitted from the 13 or 16 per cent. in which an illegitimate child, residing with its mother's parents, might have been classed as having a mother in the house if the grandmother, remaining at home, were not recorded as past child-bearing age.

Feeding of infants under one.—Since the middle of August we have made a further inquiry into the circumstances of every death registered from diarrhœa, and in young children we asked particularly as to the method of feeding. In many cases the food represented to our inspectors as given to the children would be that used after treatment had commenced, so that probably the returns shew a less vicious form of feeding than actually obtained. Some of the results have been extracted for the last six weeks of the quarter, during which time the disease reached its second acme. The deaths in this period so investigated numbered (omitting 3 where the information was incomplete) 213. Of these, 153 deaths occurred amongst infants under one somewhat less than $\frac{6}{14}$ of the 397 deaths in infants at this age which occurred during the fourteen weeks. Of these 153, 27 per cent. were less than three months old, 36 per cent. between three and six, 22 per cent. between six and nine months, and 15 per cent. between nine and twelve. These percentages nearly correspond to those for the fourteen weeks, which, as already said (page 102, note), were 26, 34, 23, and 17 respectively.

The importance of whether the mother herself feeds the very young infant is great indeed. If she does not it may be because she is weakly. It may be because she works out, and then the baby is chiefly looked after by strangers. In both cases the risk of an unsterilized feeding bottle are added.

Dividing the 153 cases into those fed entirely at the breast, and those not so fed, 24 per cent. of those less than three months old, 16 per cent. of those between three and six months, 3 per cent. of those from six to nine months, and 30 per cent. of those between nine and twelve months were stated to have been fed entirely by the mother; the percentage entirely at the breast of the whole 153 having been nearly 18.

Fourteen per cent. of all the cases under one were partly at the breast. They formed 20 per cent. of those under three months, 13, 9, and 17 per cent. at each of the next age periods.

Seventy-six per cent. of the 153 were fed by the bottle. These bottle-fed babies formed 71 per cent. of the infants under three months, 76 per cent. of those above three and under six months, while of those between six and nine months 91 per cent. were at the bottle. At the last age period 61 per cent. used the feeding bottle.

Those fed entirely artificially, otherwise than by the bottle, formed 2 per cent. of those at the earliest, 5 and 6 per cent. in the two immediately succeeding age periods, at the last period none. They were nearly 4 per cent. of the 153 cases examined into. These figures will be more easily followed if tabulated. This has been done, and the table will be found on the next page but one.

It is natural, of course, that at the first age period (0—3 months) breast milk should form the principal food of the infant. As just said, at that age 24 per cent. were stated to have been entirely so fed, and 20 per cent. partly, while 56 per cent. were fed entirely artificially. It is noteworthy that three-fourths of the fatal cases of diarrhœa in children under three months thus inquired into had not been fed as nature intended. At the next age (3—6 months), which contributed the greatest percentage of the four to the diarrhœa mortality, nearly 71 per cent. were fed entirely artificially, and only 16 per cent. by nature's method. At the next age period one would expect a larger number to be fed otherwise than by the mother, and they formed 88 per cent. of those between six and nine months, only 3 per cent. of those who died having derived their nourishment entirely from the parent. It is perhaps a little strange to find that in the fourth period 30 per cent. of the fatal cases occurred amongst children said to have been entirely at the breast.

The cases which formed this large percentage of breast-fed babies, at the higher age period (9—12 months), numbered, however, altogether only 7. In 5 of the 7 there were serious insanitary surroundings, such as open drain joints ; in a sixth a gulley in the basement was full of all manner of filth, though the joints of the drains were tight, and in the seventh, though the house was quite severed from the sewer, it was somewhat damp ; but in this case the nursing-mother had partaken rather freely of raw fruit. Details as to these seven cases will be found in another place (page 137 and table page 129).

Feeding of children from one to three.—There were 71 deaths in the fourteen weeks ended September 30th, 1893, amongst children between one and two years of age. Of these 34 were registered in the last six weeks of the quarter, and, of these, 33 were specially investigated as to diet. Of these 33, 4 (or 12 per cent.) derived their nourishment entirely from the mother, while 5 (or 15 per cent.) were partly at the breast and partly had other food, 2 of the five by bottle and the other 3 by other methods. Eleven other "bottle-babies" (or 33 per

TABLE 15 b.

Shewing in percentages, as to deaths specially inquired into, the mode of feeding of 153 infants under one, whose deaths were registered as due to diarrhœa in the six weeks ended September 30th, 1893.

AGES.	Cases inquired into.	Per cent. of the 153.	Percentages of those dying at different ages fed				
			On mother's milk only.	Partly at breast.	Not at breast at all.	By bottle.	Both at breast and bottle.
0—3 months	41	27	24	20	56	71	17
3—6 months	55	36	16	13	71	76	11
6—9 months	34	22	3	9	88	91	9
9—12 months	23	15	30	17	52	61	8
WHOLE ...	153	100	18	14	68	76	12

cent.) received their nourishment entirely artificially, 8 of them chiefly or entirely through the bottle, 3 having other food of a more or less solid description. Thirteen (or 39 per cent.) had artificial food, not by means of the bottle.

In the fourteen weeks there had been 10 deaths between the ages of two and three. Of these 7 were registered in the last six weeks of the quarter, and all 7, as might be expected, were variously fed, not by the mother herself.

Food of the bottle babies.—The diet of all the fatal cases of diarrhœa registered after August 19th was specially inquired into. The answers have been tabulated. It may be of interest to note what principally constituted that of the infant fed entirely at the bottle. As in other parts of the report, we select only the cases while the disease continued in epidemic form.

Amongst the 213 deaths inquired into during the last six weeks of the autumn quarter were 98 of children not at the breast, and who received their nourishment from the feeding bottle, with or without other food. Cows' milk formed an important part of the food of 92 of these infants. Of the 6 children who were stated to have had no milk, the food given consisted respectively of arrowroot, Benger's, Benn's and Mellin's food; Mincasia and Neaves's food, each in one instance.

In 51 of the 98 fatal cases milk—cows', condensed, or both —was used, either alone or with a little sugar, water, lime water, barley water, rice water, or similar addition not distinctly of the nature of solid food. In 34 of these 51 ordinary cows' milk was used, in two cases unboiled, in the remainder boiled, although in one case the lime water seems to have been added after and not before the boiling. In the two cases where the milk is not stated to have been boiled there is no mention of any addition. In 20 out of the 31 in which ordinary dairy milk is said to have been boiled, it is not stated to have had any addition, even water. In 17 of the 51 cases condensed milk was used. In one it had been given for two weeks before death boiled with water. Ordinary cows' milk (boiled) had been the diet before. In 10 Swiss milk was used alone, or with a diluent, boiled; in 6 alone, or with a diluent, unboiled.

We have thus accounted for 57 of the 98 cases. The remaining 41 had milk with some solid food added. In 8 Swiss milk was used, in 33 dairy milk; boiled in 30, unboiled in 3. The artificial foods used, in addition to milk, in these 3 cases were—in one, Mellin's food, boiled; in a second, Neave's, Mellin's, unboiled condensed milk, with occasionally rusks; and in the third case sweet biscuits had been given. In the 8 cases condensed milk was used along with various kinds of other food, the latter were corn flour, Benger (scalded), same boiled with lime water, arrowroot, arrowroot and warm water, scalded bread, Miller's and Brand's foods.

Ordinary dairy milk (boiled) was given along with, or in addition to, various other foods, sometimes only one, sometimes several, in 30 cases. In one case, flour ; in a second sago, arrowroot, or corn flour (boiled) ; in a third, ground rice (boiled) ; in a fourth, corn flour (boiled) ; in a fifth, pearl barley (boiled) ; and in three others arrowroot (boiled) was added. These 8 (counting those with flour and barley) were apparently the only cases in which nearly pure starch was the sole addition to the milk. In three cases bread was added, and in another rusks were given ; in another, a little egg and water. In the 17 others some form of patent or malted food was used. These facts are tabulated :—

TABLE 15 c.

Shewing diet of 98 infants under one fed by the bottle.

	Milk.			Dairy Milk and other Food.				Condensed milk and other food.		Other foods without milk.
	Alone	Diluted.	Condens'd	Starches	Bread, rusks, or biscuits.	Malted, &c.	Other.	Starches	Malted.	
Scalded or boiled	20	11	11	7	1	16	—	3	5	6
Unboiled	2	—	6	—	1	3	—	—	—	—
Partly boiled	—	1	—	1	3	—	1	—	—	—
	22	12	17	8	5	19	1	3	5	6

Cleansing of feeding bottle.—Information was obtained in regard to 129 infants fed wholly or partly by the bottle, as to the manner in which that vessel was cleansed. Of these 129 fatal cases, registered in the last six weeks of the autumn quarter, 109 were those of children fed altogether artificially, 98 out of the 109 having died in the first year of life. Twenty were fed partly at the breast and partly by the bottle, and in some cases also by additional artificial means ; 18 of the 20 were children under one. The whole 129 were under two years of age. Dealing first with the whole group, in 86 (or 67 per cent.) we were told that the feeding bottle was cleansed with boiling water, in 43 (or 33 per cent.) it was washed with warm water, presumably below the boiling point.

It has to be kept in mind, as already said, that in a considerable number of cases the information given as to the treatment of the feeding bottle might be information as to what had been done *after* the child came under treatment. In many cases, of course, as soon as a medical man was called in, he would insist that the vessel in which artificial food was administered should be scalded. In many such cases the mischief would, however, have been already done. It is also necessary to remember that, notwithstanding the considerable amount of trouble taken by the inspectors to obtain exact information, the word "scalded" would be used in a very vague manner. Very often a little warm water from the kettle having been poured into a large basin the bottle would be placed in the basin and allowed to fill, the temperature of the water having been reduced first of all by contact with the basin, then by exposure to a large surface of the air, and then by contact with the cold feeding bottle. Under these circumstances complete destruction of bacteria would not necessarily take place. Nothing, of course, should be called "scalding," except the pouring of *boiling* water into the feeding bottle *already rendered hot* by similar treatment.

So far as it goes, however, the information obtained shows that in one-third of the fatal cases there had been actually no scalding of the feeding bottle attempted, and it is possible that the "scalding" in the remaining two-thirds was very inefficient. In dealing with so small a number as 129 no great importance can be attached to sub-divisions either as to age or as to other means of feeding. I give, however, the particulars as far as they have been obtained. They may be possibly of some service when added to similar particulars obtained in future.

Dealing, first, with the cases in which the bottle is not said to have been scalded at all, the number altogether, as already said, was 43. Of these 43, in 8 the bottle is simply stated to have been "washed," either with cold or warm water; in 10 it is said to have been "washed and brushed," the brush usually employed being a wire doubled upon itself and twisted, bristles being interposed at short intervals. Brushes of this kind are very difficult to cleanse. While they serve a useful purpose in helping to remove particles of coagulated milk from the inside of the bottle, and more especially of the feeding tube, they are apt themselves to retain small particles of this albuminous food, which may soon reach a stage of partial decomposition. Unless, therefore, these brushes are disinfected by scalding, both before and after use, their employment is not unattended by the risk of re-infecting the article they are intended to cleanse.

It may probably be taken for granted that where the bottle is stated not to have been scalded, the brush was not scalded; but it by no means follows that where the bottle was scalded the brush was also scalded, and as it is exceedingly difficult to cleanse the tube without the use of the brush, I fear that in a great many cases, where some pretence of scalding the bottle actually was made, that the tube was either undisinfected or re-infected from the brush. Amongst the remaining cases where no scalding was reported, soap was used along with the brush in 2 cases, while in 13 the bottle was brushed out with soda and water. In 10 other cases the bottle was washed with soda, but no mention is made of the use of a brush. Out of the 43 the brush seems to have been employed in 25, whereas, washing with cold or warm water, or warm water and soda, was the practice in the remaining 18.

These cases, where the bottle was certainly not scalded, included those of 13 children who died under three months of age, 11 using the bottle entirely, and 2 the bottle while also at the breast. They included 12 between the ages of three and six months, none of whom were fed by the mother, 10 between the ages of six and nine months, to whom the same remark applies, and 4 between the ages of nine and twelve months, all fed entirely artificially. The remaining 4 were over one but under two years of age; 1 was fed partially at the breast and the other 3 were not.

The 86 cases in which the bottle was said to have been scalded included those of 69 infants fed entirely artificially, chiefly by the bottle, and 17 fed partly at the breast, but also by the bottle. In these 86 the feeding bottles in 31 are simply stated to have been scalded ; in 24 others to have been scalded and brushed ; in 13 more to have been brushed with soda ; making 37 in which the brush was stated to have been used with all its possible disadvantages. In 14 cases soda was used without the brush ; in 1 soap and soda ; in 1 tea leaves and salt ; in one borax, and in the remaining 1 the bottle was stated to have been scalded and cleansed with washing powder.

The 86 cases in which scalding is alleged included 15 amongst children of less than three months, 10 of whom used the bottle entirely ; 5 were also at the breast. Thirty of the 86 were more than three but less than six months old ; 24 entirely at the bottle ; 6 also at the breast. Twenty-one were more than half but less than three-quarters of a year old ; 18 of them fed entirely artificially, 3 having also breast milk. Eleven were more than nine and less than twelve months old ; 9 of them having been fed entirely artificially. Between one and two years there were 9 ; 8 of the 9 having been fed entirely artificially.

Infants at breast and fruit.—In the case of 6 out of the 58 infants, either wholly or in part at the breast, the inspector was informed that the mother had eaten uncooked fruit during the time she was suckling the child. Of these 6 infants 2 were under three months ; 1 of them entirely, the other partly, at the breast. In the latter case (Z 1340 : 2), the house drainage, though not disconnected, was tight, but there was a nuisance in the back yard. In the former (Z 1358 : 1) the drainage of the house, also not disconnected, was tested with calcium phosphide, and the smell penetrated into the dwelling. The third case (Z 1355 : 6) was that of a child between six and nine months old, entirely at the breast. The mother herself suffered from pain in the stomach and vomiting. A test applied to the drains (which were not disconnected) of the house where the patient died revealed serious faults in their construction.

The 3 remaining cases occurred amongst children between nine and twelve months old, 2 of them entirely, and 1 partly, at the breast. In the last of these (Z 1343 : 5) the drainage was not disconnected, and the smell of a test applied at the fall-pipe outside penetrated into the house. The other two (Z 1348 : 2 and Z 1354 : 9) have been already referred to as two of the 7 children between nine and twelve months of age, said to have been entirely nursed by their mothers. The details of these two cases are given elsewhere.* In Z 1348 : 2, the statement was made to the inspector that the mother ate freely of "Victoria plums and Keswick apples." The latter, on the 24th of August, would probably be "unripe" fruit, but the mother is not stated to have been ill herself. The house was found disconnected from the sewer and the drains tight, though it was somewhat damp. The other (Z 1354 : 9) was the child of an organ grinder, and has been already referred to* as one of the seven breast-fed infants, 9—12 months old. She died in a house within the walls of which and of the adjoining house there was a water closet common to both. The smell of a test put down the soil-pipe penetrated into the basement.

In addition to these 6 was a case (Z 1361 : 7) in which the mother ate "boiled apples." The child only lived twenty-one days, and had been ill from birth. The house was disconnected from the sewer, and the phosphide test revealed no leakage in the drains. In the eighth case (Z 1339 : 8), one of the 7 children between nine and twelve months already referred to as entirely at the breast,* the mother had indulged freely in cauliflower. The house was not disconnected from the sewer, and a test applied outside was smelled in several places within the dwelling. Even including these 2, we still have 50 out of 58 (or 86 per cent.) in which the statement was distinctly made to us that no fruit had been eaten by the mother. It was also distinctly stated to us that none of the 58 had any fruit themselves.

Young children, not at breast, and fruit.—Of children under three, whose deaths were registered in the six concluding weeks of the autumn quarter, 135 were not at the breast at all. It might be considered, therefore, unnecessary to inquire what the diet of their mothers was. The date when they were weaned was, however, not always given; the question was therefore put, and the answer in every case was that the mother had not eaten uncooked fruit during the time she was suckling the child. As to the children themselves it was stated of 2 (both of whom died in the second year of life) that fruit had been used. One of these (Z 1341 : 2), æt. seventeen months, had "about one apple a day uncooked." The drainage of the house where he died was not disconnected, but no leakage was discovered. The other (Z 1345 : 4), at thirteen months, lived in a house severed from the drain, which gave no evidence of fault on testing. The mother (who, however, did not suckle the child) had herself suffered from a severe attack of diarrhœa, with cramps, about a week before the child was taken ill. The mother's attack followed a heavy meal of fried fish and potatoes. She stated that the child did not get any of this delicacy, but that his diet was ordinary, and that he "ate a bit of everything they had, except meat." He had unboiled milk and water, but no patent foods, and was allowed to chew a raw apple, and as he seemed to like it, they roasted one and gave it him.

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* Page 116. See also table page 129.

Fruit in older persons.—Amongst the 213 cases were 20 other deaths, all of them at ages from six years and upwards. Twelve were under sixty-five and 8 above. Amongst the latter a man of sixty-six (Z 1337 : 8) is said to have "eaten a great quantity of plums," also "roast apple . . . moderately ripe." A test put into the drain outside the house was distinctly smelled inside the scullery, underneath the sink. This man, however, had a paralytic seizure some two years before. The only other case, amongst these 20, in which fruit was said to have been taken, was that of a woman of forty (Z 1362 : 5), who "had eaten a few apples, also a few plums from Nottinghamshire." Two other members of her family had had diarrhœa and recovered. There was an offensive midden two yards from the house in which she died. The sink waste on the ground floor was trapped, and passed to a box trap below. A test put down the sink on the ground floor did not reveal itself in the basement.

Results as to fruit.—In regard to the 213 patients whose deaths from diarrhœa were specially inquired into, 4, all of whom were more than one year old, had eaten fruit themselves. Six other patients (not including any of these 4), may have suffered through the mother who ate uncooked fruit while they were at the breast. In 2 others the mother had partaken of cooked fruit or cooked vegetables under similar conditions. Even including these the whole number in which fruit or vegetables could be connected with the illness was 12, or less than 6 per cent. The number dealt with is, of course, too small for any rigid inference, and the inquiry not being made by experts is liable to certain other fallacies. There is, of course, a difficulty in inquiring into the history of cases several days after death, the memory of relatives is often treacherous, and they might occasionally forget that fruit had been used where such had really been the case. A considerable amount of pains was, however, taken in getting at the facts, and I think the inquiry was even less open to fallacy in regard to fruit than, for instance, in regard to cleansing of feeding bottles and the feeding of the baby. In one-half of these 12 cases it was found, on making a test of the drains, that the smell of the test penetrated into the house. In the remaining half there were circumstances either in regard to the health of the patient or the proximity of neighbouring nuisances which might of themselves have tended to produce the attack of diarrhœa. On the whole, so far as it goes, our inquiry would seem to indicate that the influence of fruit in the production of fatal diarrhœa last autumn in Leeds had not been very great.

Mixed motives.—From what has been already said under the head of causation, and from the statement in the early part of the subject as to house conditions, it will have been noticed that in a third of the cases specially inquired into, where the feeding bottle was used, it had not been sterilized, and that in probably a good many of the remainder the brush used for feeding purposes had not been sterilized.

It will have been also seen that in 66 per cent. of the diarrhœa deaths in the year there was either no drainage, or the house drainage was not disconnected from the sewer. It has been thought well, therefore, in addition to giving these and other percentages in which the sanitation was found defective, to attempt to trace the cases individually, and shew how many of the deaths could be readily accounted for by some sanitary defect or error of diet. It will, of course, be understood that only gross errors of diet, or gross sanitary defects are necessarily detected in this way. Especially is this the case in regard to the former, the inquirer in many cases not having ascertained whether the diet which the patient was getting at the time of death was that prescribed by a physician after the commencement of illness, or the diet which the child had all along.

So large a proportion of the deaths inquired into were those of young infants, that the results in regard to children under one year of age, whose deaths were registered in the last six weeks of the quarter, have been put into the form of a table; the deaths being grouped according to the ages of the patients. As we have already seen there were 153 deaths of infants under one inquired into somewhat as follows. Twelve of these had not attained their first month. These 12 will be dealt with in detail, commencing with the youngest. Z 1360:9 was ten days old, lived in a house sufficiently large and fairly sanitary, but seemed to be one of a mixed family. He was stated to have been fed entirely at the breast. Z 1341:6 was fourteen days old, subject to fits; fed entirely artificially; the bottle is not said to have been scalded. She died in a house not severed from the drains. Z 1346:6 lived in a two-roomed house, with eight inmates; the mother, who suckled the child, had herself been ill. None of the grosser sanitary defects were discovered about the house. Z 1361:3, sixteen days old, lived also in a two-roomed house severed from the sewer; was fed partly artificially. In this case also the mother had herself been ill. Two cases (Z 1333:0 and 1359:7) were each nineteen days old. The latter lived in a house with the drains disconnected, but was fed entirely artificially. The former was also artificially fed. The bottle, though scalded, was cleaned with soda and a brush. The child had had fits for fourteen days. The mother had herself had diarrhœa, and the drainage of the house was not severed from the sewer. Z 1339:9 lived twenty days in an undisconnected house; was artificially fed; the bottle, which was not scalded, was cleansed by a brush. Two cases died when only twenty-one days old (Z 1337:4 and Z 1361:7). The latter had been ill from birth; was artificially fed. The mother was herself ill. The child was one of five, the next youngest being nine years old. The drainage of the house was severed from the sewer, and is further referred to at page 137. The former died in a house not so severed from the drain, with a dirty trough water closet a yard away. Z 1357:4 was twenty-two days old, suffered from fits, was artificially fed, and the bottle not scalded. The house was crowded, but was not described as sanitarily defective. Z 1336:7 was twenty-four days old, lived in an overcrowded house, not severed from the sewer, with a trough water closet four yards distant. Z 1339:1 was twenty-five days old, was fed partly artificially, the mother having been delicate. No objection was taken to the house as to drainage.

It will be noted that amongst the 12 who died in the first month of life, in 5 the mother was stated to be delicate. In 3 of the 12 (including 1 in the last group) there was scanty air space, there being only two rooms in the house, and respectively six, seven, and eight inmates. These three somewhat crowded-out children suffered from other disadvantages. In one, as already said, the child suffered from fits, was artificially fed, and the bottle not scalded. In the second the house was not severed from the sewer, and there was an offensive trough water closet four yards away, while in the third the child's mother was delicate. Eight of the 12 were artificially fed, 2 partially, 6 entirely so. Of these 8, 5 have been already mentioned, 4 because the mother was delicate, and 1 because the child, in an overcrowded house, had fits. Of these so artificially fed, in 4 of the 8 the bottle was scalded, in 4 not. In the 4 where the bottle was scalded, in 1 a brush was also used, and it is not stated that the brush was scalded. In another Swiss milk was employed, and it is not stated where the can was kept after it had been opened; and in a third soda was used, and it is not stated that scalding took place after the bottle had been rendered alkaline. The remaining 1 was the child of one of the four delicate mothers. Five of the 12 lived in houses not disconnected from the sewers. Four of these 5, however, have been already mentioned in one or other of the preceding sub-classes. Into one or other, or more than one, of these sub-classes, "delicate mother," "overcrowded house," "artificially fed," or "unsevered drainage," 11 out of the 12 have gone. The remaining 1 was the child of ten days already mentioned.

Without going into detail at the other ages, I print the 153 cases in the form of a table. The figures refer to the zymotic case-book, and the cases are arranged according to age. In each case, as far as possible, the same order as to "conditions" mentioned has been kept, namely—(1) illness of patient, (2) how mothered, (3) feeding, (4) cleansing of bottle, (5) overcrowding, (6) drainage, (7) results of drain tests where employed, (8) closet and other nuisances. Only departures from the healthy standard are entered in the table, and these where they are of a class generally admitted as such. "Fed artificially" is usually not further defined, but where gross errors of diet, such as feeding a child on cows' milk alone, or on starchy matters chiefly, were reported, they have been entered. Where the bottle was stated not to have been scalded, it was entered "unsterilized." Where a brush or soda was also used, that is mentioned.

It will be noted that some houses are said to be crowded—others overcrowded. The line has been drawn at three inmates to a room. Three is crowded, more than three is overcrowded.

Conditions making for disease.—It will be seen from the table, that, with the exception of 4 cases, all the 153 children under one, who died from diarrhœa in the last fourteen weeks of the autumn quarter, were more or less handicapped by conditions similar to those mentioned as to the 12 infants who had not completed their first month. In several cases the mother had been ill; in some the mother followed an employment outside the house; in a good many more the mother was not in the house at all, the child being out at nurse; in several cases the child was delicate from birth; in a large number the feeding was

TABLE 15 d.—Table of 153 deaths of children under one, from diarrhœa, in the six concluding weeks of the autumn quarter, 1893.

CASE NO.	AGE.	SEX.	CONDITIONS FAVOURING ILLNESS.
1360 : 9	10 days	M	
1341 : 6	14	F	Fits. Artificially fed, not sterilized. House not severed from sewer.
1346 : 6	15	M	Mother ill. House overcrowded.
1361 : 3	16	M	Fits. Mother ill. Fed partly artificially. Soda and brush used.
1333 : 0	19	M	Mother diarrhœa. Artificially fed. Brush and soda. House not severed from sewer.
1359 : 7	19	F	Artificially fed.
1339 : 9	20	M	" Not sterilized. Brush. House not severed.
1337 : 4	21	M	House not severed from sewer. Dirty trough closet one yard off.
1361 : 7	21	F	Ill from birth. Mother ill. Fed artificially.
1357 : 4	22	F	Fits. Fed artificially. Not sterilized. House crowded.
1336 : 7	24	M	House overcrowded, not severed from sewer. Trough closet close by.
1339 : 1	25	M	Mother delicate. Fed partly artificially.
1336 : 2	1 mo.	F	House not severed from sewer. Midden yard away.
1337 : 2	1	M	Fed artificially. Brush used.
1338 : 1	1	M	Fed partly artificially. Brush. Drains not severed. Midden yard away.
1339 : 6	1	M	Ill from birth. House drainage not severed.
1341 : 3	1	M	Artificially fed. Not sterilized. House overcrowded.
1341 : 5	1	M	
1342 : 1	1	F	Ill from birth. Artificially fed. Drains not severed.
1343 : 8	1	F	Partly fed artificially. Drains not cut off, open joints.
1345 : 0	1	M	Ill from birth. Fed artificially. Drains not severed. Other nuisances in house.
1347 : 2	1	F	Mother delicate. Fed artificially. Not sterilized. Brush. Midden one yard off.
1347 : 3	1	M	Artificially fed. Not sterilized. Soda. Drains not severed.
1347 : 5	1	F	" " " House not severed from sewer.
1351 : 9	1	F	Ill from birth. Artificially fed. Not sterilized.
1355 : 8	1	M	" " " " Brush. Trough closet one yard off.
1358 : 1	1	M	Mother had fruit. Fed partly artificially, Bottle not sterilized. Brush. Drainage not severed. Test smelled within. Midden one yard off.
1360 : 3	1	M	Artificially fed. Bottle not scalded. House crowded.
1360 : 6	1	F	" " " " House not severed from sewer.
1361 : 8	1	M	" " Milk (boiled) and rice water. Bottle not sterilized. Brush.

1335:0	2 mo.	F	Artificially fed. Arrowroot.
1339:0	2	F	,, ,, House overcrowded. Drains not severed.
1340:2	2	M	House not severed from sewer. Dirty w.c. Pool in yard from neighbour's closet.
1342:6	2	F	Mother works out. Artificially fed. Brush.
1344:2	2	F	Partly fed artificially. Arrowroot. Brush.
1348:5	2	M	,, ,, Soda. House not severed from sewer.
1348:0	2	M	Fed partly artificially.
1351:7	2	M	Artificially fed. No sterilization. Brush. House crowded.
1353:6	2	F	House not severed from sewer. Midden one yard off.
1354:1	2	F	Mother weak. Other patient in house. Fed artificially.
1361:4	2	F	Offensive midden close by.
1333:3	3	M	House overcrowded. Drains not severed.
1333:8	3	M	Mother works out. Artificially fed. Cows' milk. W.C. cistern out of order.
1334:1	3	M	Fed partly artificially. Soda.
1335:3	3	F	Mother works out. Fed artificially. Corn flour. Soda.
1335:7	3	F	Fed artificially. Soda. House not severed from sewer.
1336:0	3	M	Mother ill. Fed artificially. Brush. House crowded.
1338:0	3	M	Fed partly artificially. Soda. Midden six yards.
*1339:3	3	M	Fed milk and lime water. House not severed from sewer.
1340:9	3	M	House overcrowded. Drains not severed.
1341:4	3	F	Fed milk. Brush. Drains not severed from sewer.
1342:7	3	M	Fits—month. Artificially fed. Brush.
1345:9	3	F	Fed artificially. Swiss milk and sugar. Bottle not sterilized. House not severed from sewer.
1348:6	3	M	Mother delicate. Fed partly artificially. Brush.
1349:0	3	M	,, ,, ,, ,, House not severed from sewer.
1350:1	3	M	Drains not disconnected.
1352:7	3	F	Artificially fed. Bottle not sterilized. Soda. Drains not disconnected. Midden one yard off.
1357:6	3	M	Child delicate from birth. Fed artificially. Brush.
1357:0	5	M	Artificially fed. Drains not cut off. Trough closet one yard off.
1363:4	3	M	Two other children ill. Diarrhœa. Partly artificially fed. House not severed from sewer.
1359:6	3	F	House not severed from sewer. Midden one yard off.
1332:4	4	F	Mother ill. Diarrhœa. Artificially fed. Sago, arrowroot, corn flour. Brush. Drains not severed.
1334:3	4	M	Fed milk and water. Bottle. Soda and Brush. Midden five yards away, offensive.
1334:5	4	M	Ill from birth. Child out at nurse. Fed artificially. House dirty.

1335:2	4 mo.	M	Fed milk and lime water. Bottle not sterilized. Drains not severed. Midden two yards off.
1335:8	4	M	Fed partly artificially. Drains not severed.
1337:7	4	M	Fits. Fed artificially. Brush, soda. Drains not severed.
1339:2	4	F	Mother laundress. Fed Swiss milk. Drains not severed.
1339:5	4	F	Wasting and diarrhœa from birth. Mother had p. fever. Fed milk. Bottle not scalded. Soda.
1341:9	4	M	Drainage not disconnected. Open joints.
1342:3	4	M	Not well from birth. Mother recently dead. No woman in house. Fed artificially. Bottle not sterilized. Brush.
1343:7	4	F	Mother works out. Another child had diarrhœa. Fed boiled milk. Brush. House not severed from sewer.
1344:5	4	F	Mother works out. Fed artificially. Swiss milk. Not sterilized. Brush. Soda.
1345:1	4	F	
1346:4	4	M	Consumption of bowels from birth. Fed artificially. Cows' and Swiss milk boiled. Bottle not sterilized. House overcrowded. Drains not severed.
1347:6	4	M	Mother delicate. Fed artificially. Not sterilized. Drains not cut off. Street gulley offensive.
1350:3	4	M	Diarrhœa from birth. Fed artificially. Boiled milk. Soda. Drainage not severed.
1351:6	4	F	Another child (1351:5) æt 2, died diarrhœa. House dirty. Three rooms for family of six. One of rooms used as barber's shop. Midden dirty, eight yards off.
1353:5	4	F	Fed artificially. Milk (boiled). Drainage not severed.
1355:5	4	F	Diarrhœa 10 weeks. No member family in work. Fed Swiss milk.
1355:9	4	F	Fits. Another ill, diarrhœa. Mother stitcher at home. Artificially fed. Soda. Drains not severed. Open joints.
1358:9	4	F	Artificially fed. Soda.
1358:0	4	F	Diarrhœa 12 weeks. Fed partly artificially. Brush. Drains not severed.
1362:0	4	M	
1334:2	5	M	Wasting from birth. Mother consumptive. Fed artificially. Not sterilized.
1338:3	5	M	Artificially fed. Soda. No drains. Midden four yards off.
1340:7	5	F	Mother had diarrhœa when suckling. Child put out to nurse. Fed artificially. Brush. House not severed from sewer.
1341:7	5	F	Mother living away. Fed bottle. House not severed from sewer.
1342:0	5	M	Fits. House not severed. Midden one yard away.
*1344:7	5	F	Fed artificially. Milk (boiled). Bottle not sterilized. Soda. House overcrowded. Drains not severed.
1346:0	5	F	Fed artificially. Swiss. Arrowroot. Brush. House not severed from sewer.
1353:8	5	F	Diarrhœa from birth. Artificially fed. W.C. under scullery, not F.V.
1353:0	5	M	Fed artificially. Milk (boiled). Brush. Midden four feet off.
1357:7	5	F	Purged three months. Mother mammitis. Artificially fed. Drainage not severed.

1360 : 1	5	F	Ill from birth. Fed artificially. Not sterilized. Soda. Drains not severed.
1361 : 5	5	F	Fed milk (boiled) and flour. Not sterilized. Soda. Drains not severed.
1332 : 7	6	F	Fed milk (boiled) and barley water. Drains not severed from sewer.
1334 : 0	6	M	Fed artificially. Soda. Drains not severed from sewer.
1337 : 3	6	F	Mother had cold. Fed Swiss milk (boiled). Sink no trap. Drains not severed from sewer.
1337 : 9	6	M	Partly artificially fed. Brush. Soda. Trough closet one yard off.
1338 : 2	6	M	Fed artificially. Milk (boiled) and water. Bottle not sterilized. Brush.
1343 : 6	6	F	Fed milk (boiled) and lime water. House not severed from sewer.
1346 : 1	6	M	Fed Swiss milk, not boiled. Bottle not sterilized. Drains not severed. Basement w.c., not F.V.
1347 : 0	6	M	Fed partly artificially. Brush. Drains not severed. Midden one yard off.
1357 : 9	6	F	Diarrhœa from birth. Drainage not cut off.
1358 : 2	6	F	Diarrhœa and consumption of bowels 1 month. Family out of work. Fed milk and ground rice (boiled). Drainage not severed.
1360 : 5	6	M	Ill from birth. Artificially fed. Drains not cut off.
1363 : 3	6	M	Mother works out. Fed artificially. Bottle not sterilized. Soda.
1336 : 3	7	M	Fed milk (boiled). Brush.
1336 : 9	7	M	Child out at nurse. Fed unboiled milk. Brush. Drains not severed from sewer.
1340 : 5	7	F	Two other cases diarrhœa. Fed milk, water, and sugar (boiled). Drains not severed from sewer. Swill tub two yards off.
1342 : 2	7	M	Artificially fed. Not sterilized. Brush. Drains not cut off. Street gulley offensive, two yards.
1349 : 5	7	M	Fed artificially. Drains not cut off.
1350 : 5	7	F	Fed milk (boiled). Bottle not sterilized. Brush. Soda.
1350 : 6	7	F	Another case. Fed Swiss (boiled). Brush. Soda. Overcrowded. Drainage not severed.
1350 : 7	7	F	Twin sister of last. Other matters same.
1351 : 1	7	M	Ill from June 8th. Fed artificially. Bottle not sterilized. Brush. Soap. Drains not severed. 6-in. gulley in basement receiving two sinks.
*1332 : 9	8	M	Fed artificially. Soda. Drains not severed from sewer.
1334 : 4	8	M	,, Drains not cut off.
1337 : 0	8	F	One of twins. Looseness from birth. Fed milk (boiled) and arrowroot (boiled). Brush. Soda. Drainage not cut off.
1343 : 1	8	M	Twin brother of last. Loose from birth. Other matter as in 1337 : 0.
1338 : 9	8	F	Fits. Fed Swiss milk and lime water. Tea leaves and soda. No sink. Gulley two yards off.
1340 : 1	8	F	Fed milk (unboiled) and "ordinary" food. Cup and tube not sterilized. Drains not cut off.

1349 : 2	8 mo.	F	Ill from birth. Teething. Fed artificially.
1353 : 9	8	F	Fed milk and pearl barley (boiled). Brush. Drainage not severed.
1355 : 4	8	F	Another child ill, diarrhœa. Artificially fed. Bottle not sterilized. Brush. Soda. Drainage not cut off.
1355 : 6	8	M	Mother ate fruit when child at breast (see page 122). Drainage not cut off. Open joints.
1357 : 3	8	F	Mother works out. Fed cows' milk (boiled). Bottle not sterilized. Soda and brush. Drain not severed from sewer.
1358 : 5	8	F	Fed arrowroot (boiled). No milk. Brush. Soda.
1362 : 1	8	F	Fed milk (boiled). Bottle not sterilized. Brush. Soda. Midden one yard off.
1333 : 7	9	F	Fed partly artificially. Brush. Soda. Drains not severed from sewer.
1335 : 5	9	M	Fits. Fed artificially. Brush. Soda. ,, ,,
1338 : 8	9	M	Fits. Fed artificially.
1342 : 4	9	M	None of family at work. Fed milk (boiled). Brush. Drains not cut off. Trough closet one yard off.
1343 : 4	9	F	Bronchitis. Fed artificially. Soda.
1343 : 5	9	M	Father had diarrhœa. Mother ate over ripe plums. Child partly at breast. Cows' milk (boiled) and arrowroot (boiled). Drains not cut off, tested, found defective (v.p. 123).
1343 : 9	9	F	Fed milk and arrowroot (boiled). Drains not severed from sewer.
1345 : 2	9	M	Mother delicate when child at breast. Fed entirely artificial. Drains not severed from sewer.
1348 : 2	9	F	Died in fits. None of family in work. Mother fed child and ate apples and plums (v.p. 123). Kitchen damp.
1348 : 4	9	F	Family 8; 2 on strike. Fed milk (boiled). Bottle not sterilized. Brush. Soda. Drains not cut off. Midden one yard off.
1361 : 9	9	F	Fed Swiss milk and barley water. Bottle not sterilized. Brush. Soda. House crowded. Drains not cut off. Trough closet one yard off.
1337 : 6	10	F	Fed partly artificially. Drainage not severed.
1338 : 4	10	M	Ill from birth. Consumption of bowels. Partly artificially fed.
1339 : 8	10	M	Mother diarrhœa from cauliflower, child at breast. Drains not cut off (v.p. 123).
1340 : 0	10	M	Mother rheumatic fever while child breast. None of family in work. Drains not cut off.
1345 : 6	10	F	Fed artificially. Drains not severed from sewer. Kitchen damp.
1346 : 7	10	F	Drains not severed. Test smelled inside (v.p. 116.)
1354 : 3	10	F	Ill from July 11th, Fed milk and corn flour (boiled). Not sterilized. Soda. Drains not cut off.
1354 : 9	10	M	Mother worked, organ grinder, ate fruit and suckled child entirely. House overcrowded. Drainage not severed. W.C. (inside) soil-pipe leaking (v.p. 123).
1336 : 4	11	M	Fits. Fed artificially. Not sterilized. Soda.
1345 : 8	11	F	Mother had diarrhœa. Fed entirely at breast. Gulley trap in cellar. Drainage not severed from sewer. Test smelled inside (v.p. 116). Midden one yard off.
1350 : 8	11	F	Mother worked out. Teething. Fed milk (boiled). Washing powder. House not severed from sewer. Smell from floor.
1351 : 8	11	M	Wasting 8 months. Drains not cut off. Open joints (v.p. 116).

* Name of patient differs from that of householder. No information as to employment of mother. Many of these cases out at nurse.

from the beginning artificial; in a good many of these the feeding bottle was not sterilized, and even amongst those in which this had been done, the tube, or the brush, contained unsterilized matters; in others, again, the bottle was rendered alkaline by the use of washing soda or soap. In a very large number the houses were not severed from the sewer, while in several offensive middens or other closets existed close by. Several of these conditions were present together in some cases. In 4 cases, as just said, none of these conditions existed.

Why is diarrhœa autumnal?—It might naturally be asked why these conditions of motherlessness, improper feeding, overcrowding, want of disconnection, and dirty closets should only cause diarrhœa to any great extent in the autumn quarter. It will be remembered that the proportion existing between diarrhœa deaths in infants and those at all ages was not very greatly different in the autumn quarter from what it had been in the whole year. In the latter it was last year 75 per cent., and in the former 76 per cent. If, however, we take the remaining three quarters of the year, the percentage of diarrhœa deaths in children under one, to the whole mortality from that cause, falls to 64. In 1892 it was 56, the percentage for the whole year having been 73. There is evidently, something, therefore which intensifies during the autumn quarter the predisposition of young children to die of diarrhœa.

Though diarrhœa is classed as a zymotic disease, it by no means follows that all deaths from diarrhœa properly come under this category. If a child is improperly fed, such an amount of irritation in his digestive organs may be set up as to cause looseness of the bowels, with weakness and wasting. This looseness is not any more necessarily of a zymotic character than if it were due to chronic arsenic poisoning. The sudden marked increase of diarrhœa during the autumn months points, however, to special conditions favouring the malady, and specially increasing its incidence upon young children.

We have seen already that a high temperature and an absence of rain favour the increase of diarrhœa. We know that putrefactive processes go on most rapidly at high temperatures

We know that when rain is infrequent, particles of once living matter, floating about in our streets, in our courts and alleys, fail to be carried away to the drains. We know that these particles easily undergo putrefactive changes; more easily in hot weather. We know that the small living objects which effect the breaking up of these once living matters are excessively light; are easily dried and blown about in the dust. We know that, though dry, they readily become active on reaching moist organic surfaces. We have thus all the year in towns in large quantities, but in still larger quantities in hot weather, minute particles of fermenting material, and minute living ferments. In dry weather these are easily carried into houses and keeping cellars, deposited on vessels containing milk and other articles of food.

These putrefactive germs find ample food in the gullies over which the sink pipes disconnected from houses deliver. Still more ample is the food they find in the street gullies, into which, unfortunately, many of our Leeds housewives throw liquid slops. These germs find also quiet resting places and hotbeds for their growth in the privy midden, so frequent in our town, and even the dry ashpits do not entirely escape their attack.

In summer, during spells of very hot weather, people much occupied are apt to overtire themselves, forgetting the extra rest demanded by the extra heat. Mothers nursing their children, and attending with great difficulty to household duties during these spells of hot weather, are apt to give their offspring imperfectly formed milk. Infants themselves, suffering often from the extreme of heat, sucking corals covered with living dust, receive their nourishment from bottles imperfectly cleansed, and the contents of which have not been protected from these air-borne ferments. The warmer weather promotes at once the abundance of the infective material and favours its growth, especially on liquid foods, therefore it is in our warmer months that diarrhœa is most prevalent, and therefore most prevalent in infants who should be at the breast.

Sewers, traps, and waste pipes.—In enumerating the places upon which bacteria might settle, no mention was made of the sewers, nor of the syphon traps and box traps within houses. The sewers in our streets, unfortunately, no less than the river itself, contain abundant material in a state of advancing decomposition. Though the current is usually away from the house; the pipes leading from the houses are lined with putrescible material easily innoculated. The similar inside coating of pipes within the houses is also easily innoculated. In the table of conditions found in children under one, each house in which disconnection from the sewer had not been properly effected is mentioned. It will be inferred that non-disconnection is regarded as a contributory cause of diarrhœa. There are still, however, a few people who think if the sink be trapped with an S trap below, and still more so if, by a series of pipes, the sink waste be connected to a box trap in the cellar, that an efficient arrangement has been made for keeping out sewer gas.

To some extent this is true, but the long pipe within the house is a convenient factory for the manufacture of harmful bacteria. Of the two, I should prefer the sink waste with the single trap going straight into the sewer to the additional breeding ground for bacteria afforded by a box trap. The lead S trap is small and easily flushed. A long length of piping between the two traps is less easily cleansed. Being made of pipes of different materials jointed together it sooner or later ceases to be tight. Its junction with the earthenware box trap is hardly if ever tight, and bacteria and gases, generated in the box trap and the long length of pipe, easily enter the house.

The outside sink gully is frequently offensive. It is anything but frequently cleansed. Fortunately it is outside. The long length of pipe from the sink to the box trap is never cleansed; the boxtrap itself is seldom if ever cleansed. Unfortunately they are both within the dwelling. Not unfrequently even the double trapping of the drains does not keep air from the sewers from entering a house. The importance of the difference between houses cut off and not cut off is perhaps best illustrated by the following facts.

Result of tests in certain cases.—In sixteen houses it was thought desirable to make a somewhat more complete test as to drainage conditions. Six of these were selected because the mother of the deceased had eaten uncooked fruit, and it was desired to eliminate other causes. In two the mother had taken either cooked apples or boiled cauliflower; and in two others the children themselves ate uncooked fruit. These account for ten of the sixteen. In seven of the sixteen the child was between nine and twelve months of age, and was stated to have been fed entirely at the breast. It was felt desirable to specially inquire into these cases. Two of these seven cases belonged to the group in which the mother had fruit, and a third was the case in which the mother had eaten cauliflower. We thus account for fourteen of the sixteen cases. The two others were the cases in which persons of adult age had eaten fruit.

Of the houses in which these sixteen patients died, three were disconnected from the drains, thirteen were not. A test applied to the houses disconnected from the drains left no reason to suppose that sewer gas could penetrate into the dwellings. The three cases in which these conditions obtained were—Z 1361:7, Z 1345:4, and Z 1348:2.* (See table.)

There remain the thirteen houses not disconnected from the drain. In one of these the joints were found to be open at the time, and no test was thought necessary. The house has since been pulled down. In eight the test made its presence felt within the house. In four of the thirteen the test did not shew itself inside.†

Conclusion.—I am, therefore, of opinion that a very large proportion of deaths from diarrhœa arose from entirely preventible circumstances, some of them structural as to the houses, others the result of imperfect scavenging. By this I do not mean to imply that the cleansing department have in any way neglected the duties imposed upon them. It will be remembered that last year an experiment was made by emptying the middens and ashpits, and cleansing the street gullies more frequently in the South-East district of Leeds.

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* In the first of these the child who died was only three weeks old, and had been delicate from birth. In the second the child had not only eaten uncooked fruit, but the mother had regaled herself a week before the infant took ill with fried potatoes, and had herself suffered from diarrhœa and severe cramping pains, for which she took powerful remedies. In the third, though the child was fed entirely at the breast, the mother had eaten both apples and plums. In this house, though the drainage was tight, the living room was damp.

† These four were Z 1340:2, Z 1341:2, Z 1340:0, and Z 1362:5. In the first of these (the one in which the mother had eaten boiled fruit) there was in the small yard into which the front door opened, a pool of stagnant water from a neighbouring closet. In the second, the child had eaten uncooked apples; in the third, there was a gully in the cellar full of filth; and the fourth was the case of the woman of 40 who ate apples and plums, and other members of whose family were ill.

Had this been done throughout the whole town, and had the high diarrhœa death-rate of 1892 not decreased in 1893, it would have been open to any one to have objected that the extra scavenging had not done anything to prevent diarrhœa. Fortunately, the extra scavenging was principally confined to the South-East Registration district, though the cleansing of gullies was carried out more frequently than formerly to some extent in the North district. While the death-rate from diarrhœa in the third quarter of 1892 increased in the whole borough from 3·42 to 5·20, in 1893, it increased also considerably in every district of the borough except two. In the North district it increased in the second decimal place, an amount which it is scarcely worth while to consider. In the South-East district the death-rate from diarrhœa fell from 7·00 to 6·47. This was the only district in which the diarrhœa rate was lower in the autumn of 1893 than in that of 1892, and this was the district in which the extra scavenging was carried out. While the death-rate in South-East Leeds decreased from 7·00 to 6·47, the death-rate in the rest of Leeds (*i.e.*, less the district specially scavenged) increased from 3·07 to 5·08. Figures of this kind for a single year are not greatly to be relied upon, but they at least make out a case for the continuance of the experiment.

CHOLERA.

During the year, excluding those entered as choleraic diarrhœa, 7 deaths were returned as due to cholera; 6 of them as English and 1 of them as infantile cholera. The last was that of a child four months old, 2 of the others of children eight months and two years respectively. A fourth was that of a boy of sixteen years, and the other 3 of persons forty-one, fifty, and sixty-four respectively.

In all these cases the flushing and disinfection of the drains and emptying of the ashpits was carried out as in cases of diarrhœa, except where exaggerated precautions were taken as will be presently stated. One of the deaths, certified as due to English cholera, was that of a woman aged 41, at 5, Pleasant Road, Holbeck. The case had been reported to us on the 14th of September, as one of "cholera." Mr. Councillor Loe, who had had experience of cholera in the last epidemic in Leeds, saw the patient with me. With the consent of the medical attendant, who aided us in every way, we removed the rest of the family from the house, and having disinfected their garments housed them in the sanatorium. We disinfected the discharges and the drains with carbolic and sulphuric acids, and procured a nurse for the patient. When the patient died we made a very complete disinfection of the house and offices and the garments of the nurse. The disinfection of the house was carried out in the same manner as that of the house to be presently described. The case was probably, as the death certificate stated, one of English cholera. We were, however, greatly indebted to the medical man in attendance for thus reporting the case, and helping us as he did.

A few days before two cases had been reported by the same gentleman as cholera at Stocks Hill, Holbeck. Two men had come, strangers to the town, with a show. They had both partaken pretty freely of a meat pie in the neighbouring village of Farsley, where they had been employed in the same way. They were neither of them teetotalers. Both were removed from the house in which they were lodging to one of the sanatorium cottages. One case proved fatal. Mr. Pearson, Dr. Trevelyan, and myself made a post-mortem examination, and satisfied ourselves that death was not due to Asiatic cholera. It was accordingly certified as from gastro-enteritis.

At this house also, pending the diagnosis, it had been thought better to make a very complete disinfection of the premises. The man who died had been sick in two rooms of the house. We washed down the walls of both with a strong solution of corrosive sublimate. We then limewashed the one,

TABLE 17.

Shewing the deaths of persons under and over five, from certain causes and groups of causes in each quarter of 13 weeks, and in the 52 weeks of the year 1893.

1893.	Thirteen weeks ended April 1st, 1893.		Thirteen weeks ended July 1st, 1893.		Thirteen weeks ended Sept. 30th, 1893.		Thirteen weeks ended Dec. 30th, 1893.		Fifty-two weeks ended Dec. 30th, 1893.		Total.
	− 5	+ 5	− 5	+ 5	− 5	+ 5	− 5	+ 5	− 5	+ 5	All ages
Smallpox	...	8	2	9	1	4	1	6	4	27	31
Measles	139	11	150	7	25	1	7	1	321	20	341
Scarlatina	4	1	4	3	5	2	7	5	20	11	31
Diphtheria	7	4	10	9	7	10	8	4	32	27	59
Croup (membranous & undefined)	10	3	13	4	12	1	24	3	59	11	70
Whooping-cough	21	1	33	1	36	1	74	...	164	3	167
Continued Fever. Typhus	...	...	...	...	...	1	...	...	...	1	1
Continued Fever. Enteric	...	6	1	5	5	44	1	45	7	100	107
Continued Fever. Other or doubtful	1	2	2	...	...	...	...	1	3	3	6
Diarrhœa and Dysentery ..	7	4	54	5	454	41	37	6	552	56	608
Cholera	...	...	1	...	2	3	...	1	3	4	7
Rheumatic fever	...	3	...	4	...	...	...	2	...	9	9
Acute and sub-acute Rheumatism	...	3	...	3	...	3	...	6	...	15	15
Erysipelas...	4	1	3	3	3	2	3	2	13	8	21
Pyæmia	...	3	...	11	1	4	1	2	2	20	22
Puerperal fever	...	7	...	7	...	1	...	2	...	17	17
Ague	...	...	...	...	...	...	...	...	...	...	...
Phthisis	8	172	10	152	5	158	4	139	27	621	648
Other Tuberculous diseases ...	48	19	56	30	88	21	35	16	227	86	313
Bronchitis, Pneumonia, and Pleurisy	254	325	200	188	126	91	186	208	766	812	1578
Other diseases of the air passages	21	18	16	14	17	12	17	14	71	58	129
Influenza	3	10	1	2	...	...	1	29	5	41	46
Heart disease	...	139	1	110	...	99	3	125	4	473	477
Other diseases of the Circulatory system	...	16	...	11	...	15	2	17	2	59	61
Injuries	15	46	15	34	7	47	13	38	50	165	215
Other causes	431	537	421	400	481	452	360	451	1693	1840	3533
Total under 5	973		993		1275		784		4025		
Total over 5	...	1339		1012		1013		1123		4487	8512
TOTAL ALL AGES	2,312		2,005		2,288		1,907		8,512		

stripped and limewashed the other, and stoved the whole house with sulphur, removing the family to Manston cottages until the disinfection was complete. We disinfected the drains with a mixture containing twenty ounces of crude carbolic acid and two ounces of oil of vitriol to a pailful of water. We cleared out thoroughly the hen coops and pig styes behind, cleansing the ground with green vitriol, and we did the same with the midden privy.

A few days later another case was reported to us in the near neighbourhood (Engine Place, Elland Road) as cholera. In this case, which was somewhat rapidly fatal, we procured a nurse, though we did not consider it necessary to remove the family from the house, which was a four-roomed one. Although pretty confident from the appearance of the patient, whom I saw several times with his medical attendant, that the disease was not of the Asiatic type, we thought it better on the whole to to have a bacteriological examination by an expert. Accordingly, after a post-mortem made by Dr. Trevelyan and myself, portions of the contents of various parts of the bowels, and portions of the gut, with slips of viscera were sent to Dr. Sims Woodhead, the Director of the Pathological Laboratory of the Royal Colleges of Physicians and Surgeons on the Thames Embankment. Dr. Woodhead telegraphed as soon as he had made the preliminary examination that the case did not seem to be one of Asiatic cholera, and he sent afterwards a very full account of his prolonged and careful investigation, shewing that there was no reason whatever to suspect that disease. In this case also, without waiting for the results of the bacteriological examination, the house and drains had been thoroughly disinfected in the manner already described. The garments of the occupants and all textile fabrics in the house were subjected to steam under pressure.

Other diseases.

Tables 17 and 18 correspond to the tables of the same numbers in the reports for 1891 and 1892, and nearly to those in tables 4 and 5 in 1890. Table 17 gives the deaths from certain diseases in the whole city in each quarter of the year, separating

TABLE 18.

Shewing death-rate per 1,000 of the estimated population from certain causes and groups of causes, and for the periods of time dealt with in the preceding table.

1893.	I.	II.	III.	IV.	Year.
Smallpox	0·08	0·12	0·05	0·07	0·08
Measles	1·58	1·65	0·27	0·08	0·90
Scarlatina	0·05	0·07	0·07	0·13	0·08
Diphtheria	0·12	0·20	0·18	0·13	0·15
Croup (membranous & undefined)	0·14	0·18	0·14	0·28	0·18
Whooping-cough	0·23	0·36	0·39	0·78	0·44
Continued Fever. Typhus	...	...	0·01	...	0·00
Continued Fever. Enteric	0·06	0·06	0·52	0·48	0·28
Continued Fever. Other or doubtful ...	0·03	0·02	...	0·01	0·02
Diarrhœa and Dysentery ...	0·12	0·62	5·20	0·45	1·60
Cholera	...	0·01	0·05	0·01	0·02
Rheumatic fever	0·03	0·04	...	0·02	0·02
Acute and sub-acute Rheumatism	0·03	0·03	0·03	0·06	0·04
Erysipelas	0·05	0·06	0·05	0·05	0·06
Pyæmia	0·03	0·12	0·05	0·03	0·06
Puerperal fever	0·07	0·07	0·01	0·02	0·04
Ague	...	...	...	...	...
Phthisis	1·89	1·70	1·71	1·50	1·70
Other Tuberculous diseases ...	0·70	0·90	1·15	0·54	0·82
Bronchitis, Pneumonia, and Pluerisy	6·08	4·08	2·28	4·14	4·14
Other diseases of the air passages	0·41	0·32	0·31	0·33	0·34
Influenza	0·14	0·03	...	0·32	0·12
Heart disease*	1·46	1·17	1·04	1·34	1·25
Other diseases of the Circulatory system	0·17	0·12	0·16	0·20	0·16
Injuries, &c.	0·64	0·52	0·57	0·54	0·56
Other causes	10·17	8·62	9·80	8·52	9·28
All causes	24·29	21·04	24·05	20·03	22·35

* Includes 8 deaths from Angina pectoris, not entered under heart disease in table A. See note to table C, and 1892 report, page 83.

those of children under 5 from those of persons above that age. The grouping of diseases corresponds upon the whole with that in table A. required by the Local Government Board ; some of the groups are, however, a little more detailed. The group of tuberculous diseases, other than phthisis, has been added, and a group of respiratory diseases, other than bronchitis, pneumonia, pleurisy and phthisis. Similarly, other diseases of the circulatory system are separated from heart disease. In reports previous to that for 1892 they were grouped along with heart disease. In the same way acute and sub-acute rheumatism, which should have been included along with rheumatic fever, but were not, have been added in a separate line. The Local Government Board's new table A. has a heading, "membranous croup." The previous heading in the old table most nearly corresponding to this, was "non-spasmodic croup." Although the Registrar-General now includes membranous croup along with diphtheria, in order that our returns may compare in such respect as nearly as possible with those of former years, we have not adopted the definition of membranous croup, but have kept the old heading, "non-spasmodic croup."

Tables 17 and 18 contain the deaths in the whole city, including those at Manston Fever Hospital. Table A., in the Appendix, accounts for these deaths under and over the age of five, as they occurred in the several districts of the city, the Infirmary, with the Women and Children's Hospital, being considered as one district, and the various Borough Fever Hospitals as another, and each Workhouse as a separate district. In table C. the deaths which occurred in all the public institutions amongst persons belonging to the borough have been referred to the district in which the people previously lived, the deaths of outsiders being placed in separate columns, but included in the general total. Like table A. the mortality is shewn both under and over the age of five, but the classification of death-causes is in much greater detail.

Rheumatism.—The deaths registered from rheumatic fever were 1 more in 1893 than in 1892. Those from acute rheumatism were 5 less. Taking the two groups together, the deaths were equivalent to a rate of ·06 per 1,000 of the population, against ·07 in 1892, ·06 in 1891, and ·05 in 1890. These figures do not take into account, however, 22 cases returned as "rheumatism." Of these 1 was returned as "rheumatism, hyperpyrexia," and should have been more correctly given under the heading of rheumatic fever. Another was returned as "rheumatism, five weeks," and should, of course, have gone under acute rheumatism. In 14 others cardiac disease was stated to have been present, and these 14 cases might possibly as correctly have been registered under heart disease. The Coroner returned one death as due to "rheumatism and weak heart;" this was probably an opinion of the jury. Another death was returned from "rheumatism, embolism," but there was nothing to shew whether the embolism was the cause of the rheumatism, or the rheumatism the cause of the embolism. Another death was returned as due to "chronic rheumatism, hemiplegia." This death might possibly have been as correctly attributed to disease of the nervous system. A case was registered as "chronic rheumatism, phthisis"; another "rheumatism, meningitis." There is also a difficulty as to the meaning of "acute rheumatism." One death was registered as from "acute rheumatism, 4 months, cardiac disease," and another "rheumatism, 11 years, cardiac disease 11 years," and a third "acute rheumatism, mitral disease, 5 years." A large proportion, therefore, of those who died from rheumatism had acquired the disease before the year with which we are dealing. It is not possible, therefore, to attach any great importance to the fluctuations in the deaths from rheumatism.

Erysipelas caused 21 deaths in 1893, or at a rate of ·06 per 1,000. The corresponding rates were ·05, ·04, and ·08 in the three preceding years. Pyæmia, in which are included septicæmia (not ascertained to be puerperal) and phlebitis, was credited with 22 deaths, or at the annual rate of ·06 per 1,000 of the population. The ratios in the three preceding years were ·01, ·04, and ·06.

Ague was not credited with causing any death.

Heart disease caused 477, and other circulatory diseases 61 deaths, equivalent to 1·25 and 0·16 per 1,000 persons living. The corresponding figures last year were 1·24 and 0·17. Taking the two groups together the rates were 1·41 in 1893, 1·41 in 1892, 1·46 in 1891, and 1·51 in 1890. The addition of 15 deaths (including the one returned by the Coroner) from heart disease entered under rheumatic fever, acute rheumatism, or rheumatism, will disturb this proportion, but without going to the original returns it would be difficult to make any comparison as to former years.

Injury or accident was the cause of 215 deaths, or at a rate of ·56 per 1,000. The corresponding rates were ·65, ·68, and ·64 in 1892, 1891, and 1890.

PART III.—HEALTH OF DISTRICTS.

HEALTH OF DISTRICTS.—I propose to deal, as last year, (1) with the Municipal Wards; (2) with the Registration Sub-Districts, our older sanitary areas; (3) but only briefly with areas specially investigated; and (4) with some other factors affecting localities.

(1) MUNICIPAL WARDS.

Populations.—Last year's report explained, somewhat at length, the method by which the populations for the several wards had been estimated, and the fallacies attending the method. In default of a better, the same process has been followed in 1893. Any errors in the populations for 1892 due to this mode of estimation are probably exaggerated in 1893. The method employed may be briefly described as follows, in the words of last year's report:—" Assuming the correctness of the 1881 and 1891 population, the geometrical rate of increase for the period was ascertained for each ward. From the rates so found, ward populations were calculated. The sum of the results gave a population larger than that similarly estimated for the borough as a whole. The numbers for the wards were therefore reduced by the subtraction of a proportionate share of the difference, and in this way the populations in the annexed table have been obtained."

TABLE 19.

Table shewing deaths in the four quarters of the year 1893, for each Municipal Ward, with the estimated population and the death-rate of the ward for the Year.

MUNICIPAL WARDS.	Population, estimated to middle of 1893.	First Quarter, 1893.	Second Quarter, 1893.	Third Quarter, 1893.	Fourth Quarter, 1893.	Fifty-two Weeks.	Death-rate.
Central	23,468	142	117	123	91	473	*20·2*
North	27,845	168	153	175	130	626	*22·5*
North-East	24,442	188	167	200	116	671	*27·5*
East	26,303	219	244	194	151	808	*30·8*
South	17,374	128	102	122	105	457	*26·4*
East Hunslet ...	27,022	138	170	160	139	607	*22·5*
West Hunslet ...	24,800	129	110	159	99	497	*20·1*
Holbeck	21,730	157	127	145	114	543	*25·0*
Mill Hill	9,197	50	32	37	51	170	*18·6*
West	25,157	164	126	141	120	551	*21·9*
North-West... ...	29,697	168	123	152	144	587	*19·8*
Brunswick	23,689	121	92	115	120	448	*19·3*
New Wortley ...	19,769	91	92	96	105	384	*19·5*
Armley & Wortley	28,517	147	106	168	128	549	*19·3*
Bramley	19,275	105	65	95	113	378	*19·7*
Headingley	33,809	163	143	170	140	616	*18·3*
Outsiders	...	34	36	36	41	147	
Totals	382,094	2,312	2,005	2,288	1,907	8,512	*22·4*

Each quarter consisted of 13 weeks.

I would again, in connection with this matter, express my hope that an intermediate census may be taken in 1896, and if the Registrar-General is not empowered by Parliament to take such a census, that the Corporation will do so themselves. Even a census of inhabited houses would give more accurate data from which to estimate the ward populations than those at present at command.

Death-rates.—Assuming the correctness of the estimated populations, the 16 municipal wards had death-rates for the year varying from 18·3 in Headingley, to 30·8 in the East Ward. The corresponding numbers in those wards last year were 13·0 and 23·7. Deducting the deaths of 147 persons who do not belong to us, the death-rate for the city was 21·97. Ten of the wards had a lower death-rate than this, namely, Headingley 18·3, Mill Hill 18·6, Armley and Wortley 19·3, Brunswick 19·3, New Wortley 19·5, Bramley 19·7, North West 19·8, West Hunslet 20·1, Central 20·2, and West 21·9. Of these it will be noted that eight belonged to the western, and two to the eastern division of the borough. Six of the wards had a death-rate higher than that of the borough as a whole, excluding again the deaths which could not be distributed to any ward in the city. These six, ranged in order of highest mortality downwards, were:—East 30·8, North-East 27·5, South 26·4, Holbeck 25·0, East Hunslet 22·5, and North 22·5. All six belong to the eastern division of the city.

In 1892 it may be remembered that six wards of the western division, and two of the eastern had rates below that of the borough, while six of the eastern and two of the western had rates above. In 1893 the eight wards of the western division as a whole had a rate of 19·6, while the eight wards of the eastern division had a rate of 24·3. The corresponding numbers in 1892 were 17·6 and 23·8, an increase most marked in what was in both years the healthier division of the town. While the eastern division increased its higher mortality by 2 per cent., the lower mortality of the western division increased by 11 per cent.

(2) REGISTRATION SUB-DISTRICTS.

Population.—The method adopted in obtaining the populations for these districts in 1892 was detailed fully in the report for that year at pages 87—90. A slight alteration has been made in the way of estimating the population for 1893. The method adopted is as follows:—Ignoring the births in public institutions, and the deaths of persons not belonging to the borough, and distributing the deaths in public institutions of persons belonging to the borough to their proper districts, the excess of the births over deaths in each district since the census

TABLE 20.

Shewing the number of deaths from certain specific causes, and groups of causes, in the 52 weeks of 1893, in the sub-registration districts of the City of Leeds. All deaths in public Institutions within the city of persons belonging to the city have been referred to the sub-district to which they belonged.

	Small-pox.	Measles.	Scarlatina.	Diphtheria.	Whooping Cough.	Fever.	Diarrhœa.	All Seven.	Croup.	Phthisis.	Influenza and Diseases of the Air Passages other than Consumption.	All other Causes.	All Causes.
Leeds, North	8	52	5	9	23	15	116	228	7	164	350	795	1544
,, West ...	5	48	4	15	27	15	114	228	12	144	357	994	1735
,, South-E.	5	73	...	4	24	10	67	183	13	74	247	505	1022
Hunslet	3	86	7	9	40	20	114	279	11	72	279	706	1347
Holbeck ...	1	20	...	6	17	10	52	106	7	34	112	304	563
Wortley... ...	5	12	9	1	11	27	69	134	13	80	164	605	996
Kirkstall ...	...	27	3	6	15	10	42	103	1	43	117	341	605
Bramley... ...	3	14	1	4	8	4	19	53	3	14	70	172	312
Chapeltown ...	...	7	1	4	2	1	15	30	3	14	42	145	234
Whitkirk ...	...	...	...	...	...	...	...	...	...	1	1	5	7
City of Leeds ...	30	339	30	58	167	112	608	1344	70	640	1739	4572	8365

1 death from small-pox, 2 from measles, 1 from scarlatina, 1 from diphtheria, 2 from fever, 8 from phthisis, 14 from influenza and diseases of the air passages other than consumption, and 118 deaths from other causes occurred in the city of persons not belonging to Leeds.

has been added to the enumerated population in 1891, and the population, so obtained by natural increase, noted down. These populations, however, added together, come to less than the population assumed by the Registrar-General as that of the borough, and the difference between their sum and the Registrar-General's population for Leeds has been distributed in the following manner. The population for each district having been got out in the ordinary manner by geometrical progression, where that obtained by natural increase was not less than that obtained by geometrical increase, the former has been considered the population of the district. To those districts where the population by natural increase fell short of that by geometrical increase, the difference between the total natural increase and the total geometrical increase of the city has been distributed in proportion to such shortcoming. The population of Whitkirk has been again regarded as stationary, and left out altogether in making these calculations.

As the populations could not be calculated in this way until the middle of the year, provisional populations were obtained by increasing the estimated population of 1892 proportionally. This provisional population was used for the monthly and quarterly reports during 1893, but the district rates in this report are calculated on the revised populations described above. This method allows for the whole of the natural increase, and is, perhaps, an improvement upon the one adopted for 1892.

Mortality.—Table 20 shews the deaths from each of the seven zymotic diseases, with those from croup, phthsis, influenza, and other lung diseases and "all other causes." These are distributed according to the registration districts to which the patients belonged. All deaths in the four Workhouses, the Hospital for Women and Children, the Infirmary, and the Fever Hospitals having been referred, with infinite trouble, to the original or last known home of the inmates. The 147 deaths which could not be referred have been left out of this table altogether, although their grouping is shewn in a note at the foot. The following table (21) shews the death-rates per 1,000 from the same groups, in each district of the city.

TABLE 21.

Shewing the mortality stated in deaths per 1,000 of the populations of the sub-districts, as estimated to the middle of 1893.

	Small-pox.	Measles.	Scarlatina.	Diphtheria.	Whooping Cough.	"Fever."	Diarrhœa.	All Seven.	Croup.	Phthisis.	Influenza and Diseases of the Air Passages, other than Consumption.	All Other Causes.	All Causes.
Leeds, North	0·13	0·83	0·08	0·14	0·37	0·24	1·86	3·66	0·11	2·63	5·62	12·76	24·77
,, West	0·06	0·56	0·05	0·17	0·32	0·17	1·34	2·67	0·14	1·69	4·18	11·65	20·33
,, S. E.	0·15	2·15	...	0·12	0·71	0·29	1·97	5·38	0·38	2·18	7·26	14·85	30·05
Hunslet ...	0·05	1·42	0·12	0·15	0.66	0·33	1·88	4·61	0·18	1·19	4·61	11·68	22·27
Holbeck ...	0·04	0·83	...	0·25	0·71	0·41	2·16	4·40	0·29	1·41	4·64	12·61	23·35
Wortley ...	0·10	0·23	0·18	0·02	0·21	0·53	1·34	2·60	0·25	1·56	3·19	11·76	19·36
Kirkstall ...	...	0·83	0·09	0·19	0·46	0·31	1·30	3·18	0·03	1·33	3·62	10·55	18·71
Bramley ...	0·19	0·89	0·06	0·26	0·51	0·26	1·22	3·40	0·19	0·89	4·49	11·03	20·01
Chapeltown	...	0·48	0·07	0·27	0·14	0·07	1·03	2·06	0·21	0·96	2·88	9·93	16·04
Whitkirk ...	...	...	...	...	...	...	...	...	...	2·33	2·33	11·64	16·29
Cty. of Leeds	0·08	0·89	0·08	0·15	0·44	0·29	1·60	3·53	0·18	1·68	4·57	12·01	21·97

1 death from small-pox, 2 from measles, 1 from scarlatina, 1 from diphtheria, 2 from fever, 8 from phthisis, 14 from influenza and diseases of the air passages other than consumption, and 118 deaths from other causes occurred in the city of persons not belonging to Leeds.

Small-pox.—The incidence of small-pox in the several wards of the borough was shewn in table 9. The mortality records of the several districts of the borough are given in tables 20 and 21. Amongst the inhabitants of Kirkstall, Chapeltown, and Whitkirk, no death from this disease was recorded. Death-rates of 4, 5, and 6 per 100,000* are credited to Holbeck, Hunslet, and West Leeds. Wortley had 10, North Leeds 13, South-

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* These rates are given on 100,000 instead of 1,000 to avoid the use of decimals. The rates given in table 21 are per 1,000 of the population. By neglecting the decimal points they may be read per 100,000 as in the text.

East Leeds 15, and Bramley 19 deaths on a similar population. In 1892 it was pointed out that the highest death-rate from small-pox of any district was in Bramley (13 per 100,000). This comparatively high death-rate had been caused by 2 deaths of persons belonging to that district. In the year we are considering there were 3 deaths.

Measles was most fatal in South-East Leeds, causing a rate of 215 per 100,000 of the estimated population. Hunslet followed with a rate of 142; then Bramley came with a rate of 89, the same as that of the city, less outsiders. Kirkstall, North Leeds, and Holbeck followed, each with a rate of 83 per 100,000, West Leeds with 56, Chapeltown 48, and Wortley 23. Whitkirk was the only district with no record. In the previous year measles had been most prevalent in Wortley, North Leeds, and Hunslet.

Scarlatina, as already said, was not very fatal. The rate for the borough, less outsiders, was 8 per 100,000. Wortley had a rate of 18, Hunslet 12, Kirkstall 9, and North Leeds of 8, the same as that of the city. Then followed Chapeltown 7, Bramley 6, West Leeds 5, South-East Leeds, Holbeck, and Whitkirk having blank returns. The highest proportionate mortality in 1892, when the disease in the city was more than twice as fatal, was in Wortley, though it was an important factor in Hunslet, Kirkstall, and Holbeck.

Diphtheria was fatal in every district but Whitkirk. The average mortality was 15 per 100,000. In Chapeltown it was 27, in Bramley 26, in Holbeck 25, in Kirkstall 19, in West Leeds 17, in Hunslet 15, in North Leeds 14, in South-East Leeds 12, and in Wortley 2. In 1892 the highest mortality was in Kirkstall, North Leeds, and Wortley.

If, however, we include croup, of all kinds not spasmodic, the rates in the districts become as follows:—Holbeck 54, South-East Leeds 50, Chapeltown 48, Bramley 45; all these above the mortality for the city, less outsiders, which was 33. Then came Hunslet 33, West Leeds 31, Wortley 27, North Leeds 25, Kirkstall 22, and Whitkirk *nil*. The heaviest mortality in the previous year from the two diseases had been in

South-East Leeds (45), then North Leeds, Bramley, Holbeck, and Wortley, with 28, 27, 21, and 20 respectively. The 1892 rate in the city had been 21.

Whooping-cough.—Whitkirk again was the only district with no record. The city death-rate, less outsiders, was 44 per 100,000, and the mortality varied in the districts in which deaths occurred from 14 in Chapeltown to 71 in Holbeck and South-East Leeds. Hunslet and South-East Leeds suffered most from this disease the previous year.

Continued fever, almost entirely typhoid, caused the highest mortality (53 per 100,000) in Wortley, the lowest (7) in Chapeltown, In Whitkirk there was no death. Holbeck, Hunslet, and Kirkstall followed Wortley, but at some little distance. Last year Holbeck had the highest rate, then Hunslet and West Leeds. The whole rate for the city, 29 per 100,000, was considerably higher than that for the preceding year (17). Five districts had a rate higher than that of the city, and (including Whitkirk) 5 lower. (See also page 158.)

Diarrhœa was most fatal in Holbeck (216 per 100,000). Then came South-East Leeds (197), Hunslet (188), North Leeds (186), all above the rate for the city, less outsiders. Whitkirk again had no record. Amongst the other districts Chapeltown (103), and Bramley (122) came lowest. These were followed by Kirkstall (130), Wortley and West Leeds (134).

The previous year South-East Leeds had the highest death-rate, then came North Leeds, Holbeck, Hunslet, Wortley, and West Leeds. Although the diarrhœa rate of South-East Leeds remained high in 1893 (197) it was considerably lower than the rate for the preceding year (205), notwithstanding that the rate for the whole town (less outsiders) had increased from 110 per 100,000 in 1892, to 160 in 1893. This matter has been already spoken of in dealing with special diseases (p. 138).

Seven zymotics.—Taking the seven zymotics as a whole, the city rate, less outsiders, was 353 per 100,000. This rate was exceeded in South-East Leeds (538), in Hunslet (461), in Holbeck (440), and in North Leeds (366). The lowest mortality (after Whitkirk, in which there was no death) was that of

Chapeltown 206, followed by Wortley 260, West Leeds 267, Kirkstall 318, and Bramley 340. The highest rates in the preceding year from the group were in North Leeds (294), South-East Leeds (288), Hunslet (262), Wortley (256), and Holbeck (251). The high death-rate from the group this year is largely due to the increased mortality from diarrhœa, 160 against 110; from measles, 89 against 20; and from fever, 29 against 17. The rate was also higher, though not high, from small-pox. It was higher from diphtheria, very slightly higher from whooping-cough, and lower from scarlet fever.

Consumption was credited with 168 deaths per 100,000 of the population amongst persons belonging to the borough. The rate in 1892, which it must be remembered was an exceedingly healthy year, was 140. The highest mortality occurred in North Leeds (263), then came the usually healthy district of Whitkirk (233), the high rate being due to one death. Next came South-East Leeds (218), followed by West Leeds (169), all these above the rate for the city. The lowest death-rate was in Bramley (89), then Chapeltown (96), Hunslet (119), Kirkstall (133), Wortley (156). In 1892 the rate from this disease was highest in North Leeds, South-East Leeds, and West Leeds.

Influenza and lung diseases other than consumption.—This group caused a rate of 457 deaths per 100,000 of the population, excluding all deaths of persons who could not be referred to some district of the borough. The corresponding rate last year was 454, only very slightly different. The highest rates were in South-East Leeds (721), North (562), Holbeck (464), Hunslet (461), all above the rate for the borough. Whitkirk had the lowest rate (233), caused by 1 death, then came Chapeltown (288), Wortley (319), Kirkstall (362), West (418), followed by Bramley (449), almost approaching the average for the borough. The highest rate last year was in South-East Leeds, followed by Holbeck, North Leeds, and Hunslet.

All causes.—The death-rate from all causes in the city, after deducting 147 outsiders, was 21·97 per 1,000.* Four districts had higher rates, South-East Leeds (30·05), North Leeds (24·77), Holbeck (23·35), and Hunslet (22·27). The lowest rates were Chapeltown (16·04), Whitkirk (16·29), Kirkstall (18·71), Wortley (19·36), Bramley (20·01), and West Leeds (20·33).

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* Rates per 1,000 are again used in dealing with the larger numbers.

(3) AREAS SPECIALLY INVESTIGATED.

SOUTH-EAST LEEDS.

In the last report the New Wortley Ward and the registration sub-district of South-East Leeds were specially dealt with. I postpone matter about other districts, but wish to refer again to South-East Leeds; a part of the borough which has received a very special amount of attention during the year. It was pointed out in my report for 1892 that the mortality of the city for the three years 1890-1-2, including deaths of persons in public institutions who belonged to the town, had been equivalent to an annual rate per 1,000 of 21·43. On the other hand, South-East Leeds (including the deaths of those belonging to the district who died in hospitals in other parts of the city) had a rate for the same period of 27·75, a difference of 6·32 per 1,000 of the population against the South-East district. It was also pointed out that for every 100 deaths amongst a given population in the borough there had been in these three years for the same number of people 130 deaths in the South-East district. In the year 1893 the death-rate for the borough was 21·97 per 1,000 persons living, and for South-East Leeds 30·05, that is to say, for every 100 deaths in a given population in the city there were 138 in South-East Leeds.

Proportionate mortality from disease groups in 1893.—Dividing the death causes into groups, it will be found that for every 100 deaths in the city from the seven zymotic diseases, including croup, there were 155 in the same population in South-East Leeds. For every 100 deaths from consumption in the city, amongst a similar population in South-East Leeds there were 129. For every 100 deaths from diseases of the lungs and air passages, other than consumption, there were 159. From the groups of causes not included in the foregoing, for every 100 deaths in Leeds there were 123 amongst a similar population in the South-East district.

Comparison with mortality in triennium.—Dealing with the three years' returns for Leeds and its South-East district, it will be found that in the same way the proportion of deaths in that district from croup and the seven zymotics, for every 100 deaths in the same population in Leeds, had been 139, for phthisis 129, diseases of the breathing organs 152, other causes 118, and all causes, as already said, 130. While, therefore, the percentage from all causes increased from 130 in the three-year period, 1890-1-2, to 138 in 1893, it increased in the group of croup and the seven zymotic diseases from 139 to 155. From phthisis it was 129 both in 1893 and in the triennium preceding it. Upon the lung disease group it increased from 152 to 159, from the group of other causes from 118 to 123.

The seven commoner zymotics group.—Considering the zymotic group alone, and its several members in detail, it will be found that the proportions in South-East Leeds corresponding to 100 deaths in the city, would be as follows:—measles 170 in the three-year group, rising to 242 in 1893; on the other hand, diphtheria and croup taken together had 135 deaths in the triennium, and 152 in 1893. Whooping-cough had 123 in the triennium, and 161 in 1893. "Fever" 99 in the triennium, the rate being below that of Leeds, and 100 in 1893. Diarrhœa had 153 in the triennium, 123 last year. Taking these groups together, their average was 136 deaths in South-East Leeds in the triennium, and 156 in 1893.* On the other hand, scarlet fever had no record in 1893 in South-East Leeds, and small-pox had no record in the triennium. The latter had a fatality of 187 in South-East Leeds for every 100 in a similar population of the borough in 1893, the former (scarlet fever) had a mortality of 105 to 100 deaths in the borough in the triennium, and nothing at all last year. It is evident, therefore, excluding these two diseases, that the zymotic increase in South-East Leeds has been chiefly due to measles, whooping-cough, and the group of diphtheria and croup, and in the last case of croup rather than diphtheria. The increase from "fever" was practically *nil*, and from diarrhœa in 1893 there was actually a decrease. While in 1893 our death-rate from diarrhœa had been 123 in South-East Leeds for every 100 deaths in a similar population in the city, in the triennium it had been 153.

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* These are not the figures for the group of five diseases, but the average of the figures representing its members individually. The group of five caused deaths in South-East Leeds as 132 to 100 in the city in the triennium, and as 158 to 100 in 1893.

Comforting consideration.—The fact that scarlet fever and continued fever, the two diseases which we deal with by hospital isolation, are not on the increase, and are not in excess in this specially unhealthy part of the town, would seem to indicate that our efforts in this direction had not been without some effect. The diminution also in the proportionate difference in the diarrhœa rate may perhaps be regarded as to some extent due to the special cleansing measures taken in that district by order of the Committee. But for these two items of hospital isolation, continued now for several years, and the extra amount of scavenging to which this district was subjected in 1893, the mortality would probably have been very much higher than it was.

Increased mortality from diseases of the breathing organs.—The greatest proportionate increase of the disease premium during the year was in measles and whooping-cough, two diseases specially affecting the lungs; diseases in fact in which the mortality is very largely due to bronchial complications. There was, however, no increase, but rather a slight decrease in the amount of the heavy premium paid in this district to lung diseases. In the triennium, in South-East Leeds there were 159 deaths for every 100 in the city. In 1893 South-East had 152. It is still the case, however, that lung affections contributed largely to the higher mortality of South-East Leeds. Taking measles, whooping-cough, and lung affections (other than consumption, but including influenza), together, the death-rate for the triennium in the borough was 6·23 per 1,000 of the population, and in South-East Leeds 9·41, or as 100 is to 151, that is 51 per cent. premium. In 1893 the rates from the same diseases in the city were 5·90 and 10·12, or as 100 to 172; the premium having risen from 51 to 72, and this although 1893 was on the whole a dry and pleasant year.

Young children.—This mortality is not entirely due, as might perhaps be supposed, to the deaths of the very youngest children. In the three years 1890-1-2, there were 149 deaths in children under one for every 1,000 births in England and Wales. The corresponding number for our own town was 173, but in South-East Leeds it was 210. That is to say, where Leeds, as a whole, had 100 deaths amongst a certain number of births, there were 116 in these years in South-East Leeds, while the proportion at all causes was as 100 to 130.

In the year 1893 there were 206 deaths in the City of Leeds for every 1,000 births, and in South-East Leeds 244. Put the other way, for every 100 deaths of children under one year of age, in relation to a given number of births in the city, there were 118 in South-East Leeds, an increase of the premium from 16 to 18. At all ages the increase was from 30 to 38, or more than double. It is not probably, therefore, at the very earliest age period that we have to look for the principal increase in our mortality.

At the next age period given in table A, part 2, that is from 1 to 5 years, the proportion of deaths in South-East Leeds in 1893 was as 177 to 100 in the city. In the preceding triennium the proportion had been as 100 in the city to 155 in South-East Leeds. It would seem, therefore, that it was at this age period that the increase in the proportionate mortality for 1893 in the South-East district chiefly occurred. For every 1,000 of the whole population of South-East Leeds in the three years there were two more deaths between the ages of 1 and 5 than in the city as a whole. For every 1,000 in 1893 there were 3 more deaths at this age. This increase is nearly the same whether we take deaths between 1 and 2, between 2 and 5, or all between 1 and 5.

(4) OTHER LOCAL FACTORS.

I hoped to have dealt in detail in the present report with the house-to-house work done in the Mill Hill and West Wards, but am reluctantly compelled to postpone the full analysis of that work to another report.

Typhoid and diarrhœal districts.—In the report for 1892 it was mentioned that an index was being formed, shewing the localisation during recent years of typhoid and diarrhœa in the borough. This index has been analysed, and the streets specially affected grouped under their census enumeration areas. The material at present at command is not sufficient to warrant our dealing statistically with small portions of the borough.

Typhoid mortality for four years in sub-districts.—It may be interesting, however, to see in what proportion the several registration sub-districts have been most affected with "fever" during the four years 1890-93. Ranged in order of highest mortality we begin with Whitkirk, in most respects the healthiest part of the borough. It happens, however, that in 1891 a death from typhoid occurred, equivalent on a population of 431 to a death-rate of 2·32 for that year, and of 0·58 for the four years 1890-93. This is another illustration of the disadvantage of taking areas of small population even for so long a period as four years. Next in order of highest mortality comes the sub-district of Wortley, comprising the New Wortley and Armley and Wortley Wards, with that portion of the Bramley Ward lying in the township of Farnley. This district had a population at the census of upwards of 49 thousand, and the mortality from "fever," chiefly typhoid, during the four years was 0·36 per thousand of the population estimated to the end of 1891. Next in order of mortality comes Holbeck, the census population was under 24 thousand, and the "fever" death-rate for the four years, 0·34. Then comes Hunslet, a large district with a death-rate of 0·27.

These four districts have rates above that of the city, less outsiders. South-East Leeds and Kirkstall divide the honours for the fifth place. When it is remembered that Kirkstall consists practically of the Headingley Ward, usually the healthiest in the town, whereas South-East Leeds contains the greater part of the East, and a considerable part of the South Ward, usually the least healthy in the town, it is interesting to note that the death-rate, 0·24, from continued fever was no greater in the latter than in the former. It is probable, therefore, that the careful attention paid to drainage conditions in a more unhealthy district has helped to keep down its mortality from this preventible disease to at least as low an ebb as that in the ward containing a large portion of the wealthier members of the community. Seventh on the list comes Bramley, with a mortality of 0·23. As the district had at the census less than 15 thousand, the variations in mortality in the four years were considerable. The death-rates from "fever" were in 1890, 0·20; 1891, 0·47; 1892, nothing; and in 1893, 0·26. Eighth on the list comes West Leeds, with a rate of 0·20. The population at the census was nearly 84 thousand. Last but one we have North Leeds, with a census population of nearly 61 thousand, and a "fever" death-rate for the four years of 0·17. This is the district in which the Beckett Street Hospital is situated, and the drainage from this hospital flows partly through this district and partly through South-East Leeds. In neither of these districts was the typhoid death-rate, even after their own shares of the deaths in hospital had been allocated to them, higher than that of the city, less outsiders. Last of all comes Chapeltown, a comparatively small district with under 14 thousand inhabitants at the time of the census. Its average "fever" mortality for the four years has been 0·07. In 1890 it was 0·15; the following year, *nil*; and in each of the two remaining years, 0·07. So far as districts are concerned, Chapeltown, therefore, has been most favourably situated in regard to typhoid fever during the four years.

HOUSE CONDITIONS AND DISEASE.

Dealing now only with the case-houses* examined during 1893, results as to which are summarised in table 25,† these number altogether 3,634, nearly a thousand more than were dealt with in the corresponding table last year.

Drainage.—It is convenient in considering the drainage of these case-houses to divide them into two classes: "good" and

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* Where "case-houses" are referred to, the facts relating to the actual house are re-entered for each further case occurring in it.

† This table does not include a few houses examined on account of puerperal fever, chicken-pox, erysipelas, septicœmia, and empyœma. The numbers under each group would be too small to work with for a single year.

"bad." The former contains such houses as have (1) a drain; (2) the house waste cut off from such drain, except where an inside water closet existed, and in that case such water closet having its soil-pipe carried above the eaves the same diameter as below; (3) the existing drainage, so far as examination went, apparently free from actual defect. The second class contains those houses which, in one or more of these three respects, did not come up to the required standard. The first class consisted of 1,280, the second of 2,354 case-houses. That is to say, as

TABLE 25.

Shewing case-houses examined on account of certain diseases, and some of the conditions found as to drainage and closet arrangements.

52 WEEKS, 1893.	CASES.		Total Deaths in City.	DRAINAGE.		CLOSETS.			
	Alive.	Dead.		Good.	Bad.	Water Carriage.		Midden or Pail.	None.
						W.C.	T.W.C.		
Small-pox	543	...	31	194	349	197	180	166	...
Measles (Death-houses)	...	326	341	90	236	67	116	143	...
Measles (Recovery-houses)	458	...	...	140	318	171	106	181	...
Measles (Recoveries in Death-houses)	79	...	...	26	53	26	23	30	...
Scarlet Fever	297	23	31	141	179	133	55	132	...
Diphtheria	23	55	59	33	45	34	22	22	...
Croup	..	68	70	24	44	15	21	31	1
Whooping-cough	...	167	167	58	109	48	47	71	1
Typhoid fever	301	66	107	128	239	94	102	171	...
Diarrhœa	...	605	608	206	399	139	194	272	...
Broncho-pneumonia	...	237	237	88	149	71	87	79	...
Pneumonia	...	329	341	131	198	97	93	139	...
Pleuro-pneumonia	...	18	18	4	14	9	3	6	...
Influenza	...	39	46	17	22	20	2	17	...
Totals	1701	1933	2056	1280	2354	1121	1051	1460	2

to drainage, in 35·2 per cent. of the case-houses examined, nothing structurally wrong was found. In 64·8 per cent. drainage defects, structural or other, were discovered.

Taking the 35·2, the average percentage of the case-houses dealt with in the table having good drainage, as a dividing line, it will be noticed in the first place that it is a little higher than the corresponding percentage last year, which was 34·5. Taking, therefore, this 35·2 as the dividing line for this year's data, and combining the three measles groups into one, making also another large group out of broncho-pneumonia, pneumonia, pleuro-pneumonia, and influenza, and a third by combining diphtheria and croup, there remain eight groups. Of these, four had percentages of properly drained houses below the average of the whole group, and four had a higher proportion. The former, dealing with 2,002 case-houses, consisted of the triple measles group (with an average of 29·7 per cent. of well-drained houses), of diarrhœa (with an average of 34·0), of whooping-cough (with an average of 34·7), and of typhoid fever (with an average of 34·9). The dividing line we drew at 35·2. Just above the dividing line comes small-pox, with an average of 35·7; then the pneumonia and influenza group, 38·5; diphtheria and croup, 39·0; and scarlet fever, 44·1 per cent. of well-drained houses. The total number of case-houses dealt with in these four groups was 1,632.

If we take, in the measles group, only the death-houses and recovery-houses, leaving out of account the recoveries in death-houses, the percentage of houses properly disconnected was 27·6 amongst the death-houses, and 30·6 amongst the recovery-houses.* In the small number of case-houses in which both deaths and recoveries occurred, numbering altogether 79, good drainage was found in 32·9 per cent.† Diarrhœa, as might be expected, belongs to the group in which drainage conditions were below the average of the town, or rather below the average of the houses examined in the town on account of disease of an infective type. Typhoid is also, but very slightly, below this average. Last year the corresponding average for table 25 was, as has been said, 34·5, and the average of typhoid houses, with "good" drainage, was slightly above it. Small-pox had an average of 35·7 of well-drained houses, only just above that of the whole group. The pneumonia and influenza group was also above; but it is perhaps desirable to point out that in broncho-pneumonia case-houses the percentage of well-drained houses was 37·1, whereas in the pneumonia and pleuro-pneumonia houses it was 38·9, while the small influenza group had 43·6 per cent. of well-drained houses.

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* See pp. 69 and 71.

† Dealt with as actual houses, as in notes to tables 10 and 11, these were 52, of which 17 were properly drained, 32 improperly, and 3 had no drain.

Some of the other groups deal only with small numbers. Amongst these whooping-cough deals with only 167 death-houses, the percentage therefore of 34·7 might have varied if the houses examined on account of this disease had been more numerous. Last year the percentage was 35, slightly above the average of the group in the table for that year, but the number of houses examined, 157, was again small. The importance of not dealing with small figures is specially shewn in regard to small-pox. In 1892, 114 houses were examined, of which 58 were well-drained, that is, nearly 51 per cent. It appeared, therefore, as if small-pox had selected better houses. In 1893, when 543 case-houses came on our books, the percentage of those well-drained fell to 35·7. Taking the two years together, of the 657 case-houses the percentage well drained was 38·4, considerably in excess of the whole group either in 1893, or the previous year, or of the combined average, 34·9, of the totals in table 25 for the two years.

In diphtheria with croup, also, in both years the numbers were small. In 1893 the two together only numbered 146 case-houses, and the proportion, as already said, of those well-drained was 39 per cent. The previous year 102 houses were investigated on account of the two diseases, and the proportion well-drained was 26·5. The percentage of well-drained houses for the 248 case-houses in the two years together was therefore a little under 34, less by 1 per cent. than the average of the case-houses in the tables for the two years. Even with scarlet fever the number of case-houses, 320, dealt with for 1893 is comparatively small. The year before it was 823. The proportion of well-drained houses found amongst the 1,143 case-houses of the two years was a little under 41 per cent.

Closets.—Dividing the closet arrangements of the same houses (one closet only, and that the least sanitary being counted for each*) 30·84 per cent. had some kind of ordinary water closet inside or outside the house; 28·92 had latrine closets; 40·18 had the use of middens or pails, and 0·06 had no convenience provided. The last figure, 0·06, corresponds to two houses out of 3,634 examined.

In the whole borough the proportion of the various kinds of closets is something as follows:—36·6 per cent. of our houses use water closets, 24·4 per cent. latrines, and 39·0 per cent. middens or pails.†

Dealing first with the houses that had water closets, and taking the dividing line of 30·8, the percentage of water closet houses amongst the whole 3,634, four of the eight groups had a smaller proportion of water closets. These were those of diarrhœa, 23 per cent.; typhoid, 25·6; whooping cough, 28·7; and measles, 30·6. The group of pneumonia and influenza had a proportion of 31·6, just slightly above that of the whole number tabled, but of its constituent parts the broncho-pneumonia and pleuro-pneumonia groups had just under, while the influenza group had considerably above the proportion of water closet houses found amongst the whole of those tabled. The diphtheria and croup case-houses had a proportion (33·6) of water closets amongst them intermediate between that found in the borough and the average proportion tabled. Small-pox was even nearer to the proportion in the borough (36·3), while the proportion of water closets found in scarlet fever case-houses was 41·6. What has been already said as to the small number of cases of diphtheria and croup and whooping-cough applies as much here as in dealing with good and bad drainage. In regard to all these small numbers, information such as that in table 25 becomes valuable when it extends over a period of years.

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* See under Diarrhœa, p. 109.

† For these figures I am indebted to Mr. Darley, who has recently taken a census of every ashpit in the city. The numbers are not strictly comparable to those dealt with in the table on account of the difficulty of allowing for houses with more than one convenience. To this matter I shall refer in another report.

Through houses, &c.—In table 25, and the corresponding table of last year, altogether 6,281 case-houses are dealt with. Of these 1,691 were through houses; a little short of 27 per cent. Amongst the small-pox houses, in the two years, the percentage of through houses was 36 per cent. Amongst the measles houses, numbering in the two years altogether 1,145, the through houses were a little under 20 per cent. As I have dealt in both years, under Part II., with the more important of the other groups, and as, until we know the proportion of back-to-back houses and throughs in the town (information which is being gradually but very slowly collected), the actual percentages are of comparatively little value except to contrast with such groups as the whole infective illnesses tabled, they are not repeated here. Whether the percentage (36·4) of through houses amongst the small-pox case-houses is greater than of throughs in the borough at large we have no evidence at present to say. It is greater than the proportion of throughs in the case-houses dealt with in table 25 in 1892 and 1893, and much greater than the proportion amongst measles case-houses.

MEASLES DEATH AND RECOVERY-HOUSES FOR THREE YEARS.

It is different however, when we are able to compare such groups of houses as the death-houses and recovery-houses in measles; and this, making use of the information contained in the previous reports, we are now able to do for three consecutive years, dealing with the houses in which altogether 1,770 cases of this kind occurred. During the three years, amongst these 1,770 cases heard of, 886 were in houses in which one or more proved fatal, while 884 arose in houses in which, so far as our information went, no death was recorded from measles in the same year. The 886 cases heard of in houses where one or more fatal occurred, had lived in 627 houses. In these same houses there were 229 measles cases (included in the 886) which recovered. Counting each house again for every death that occurred in it, and neglecting the recoveries for the present, there were 657 "death-houses" in the three years' tables. In the same way with the recovery-houses, counting each house again for every case which recovered, we get 884 "recovery-houses." (See also p. 69.)

Through houses, &c.—Amongst the former, or death group, the throughs were 17·5, the not throughs 82·5 per cent. Amongst the recovery group the throughs were 21·5, those not through 78·5 per cent.

Put in other words: for 100 houses which were throughs amongst the death group, there corresponded for a similar number of patients, 120 through houses in the recovery group.

Drain disconnection.—Dealing next with disconnection from the drain, interpreting the terms in the way already described under the head of measles at p. 71, amongst the death group 24·4 per cent. had drains of some kind, but every waste pipe from the house was severed from the sewer; 71·2 had waste pipes not so severed; and 4·4 death-houses had no drain whatever. The corresponding numbers in the other group of "recovery-houses" were 27·5 cut off, 70·2 not cut off, and 2·3 without drain.

That is to say, for every 100 death-houses in the first group, entirely severed from the drains, there were, for the same number of cases, 113 amongst the recovery group.

Closets.—As to closet arrangements, of the death-houses 17·2 per cent. had water closets, 38·8 trough closets, and 44 per cent. middens or pails. Amongst the recovery group, water closets obtained in 33·6 per cent., trough latrines in 24·7, and middens or pails in 41·7.

Putting these percentages, as formerly, it may therefore be considered that taking 100 death-houses, to which there were water closets, amongst the same number of patients getting well in recovery-houses, there would have been 195 case-houses with this kind of convenience.

General sanitation.—Disregarding the question of back-to-back houses, or the kind of closet, but taking into account the question (1) of whether a house was drained at all, and (2) whether, if so, these drains were cut off, whether (3) it was clean, and of its (4) not having a midden within three yards of it, and its having (5) an average of less than three occupants per room, the percentage of houses which came up to this sanitary level was amongst the death-houses 19·03, leaving 80·97 which should be regarded as insanitary from one or other of the foregoing causes. The corresponding numbers amongst the recovery-houses were 24·43 fairly sanitary, and 75·57 not so.

Again, putting the matter in the other way: for 100 out of a given number of death-houses coming up to this high-water mark of sanitation, there would be 128 amongst the same number of recovery-houses.

Overcrowding.—Again, in regard to density of population, taking not the case-houses, but the actual houses, into account, in the 627 in which death occurred, there were 1,995 rooms and 3,747 occupants, an average of 3·12 rooms per house, 5·98 inmates per house, and 1·88 inmates per room. In the other group in which recovery, and recovery only, occurred, there were 547 actual houses, containing 2,081 rooms, occupied by 3,241 persons; corresponding to 3·80 rooms, and 5·93 inmates per house, and 1·56 inmates per room.

Put proportionately, where there were 100 inmates in a given number of rooms in the second group (that is, where recovery was the rule), there were 120 inmates for the same number of rooms in the houses in which death had occurred.

PART IV.—DEPARTMENTAL WORK.

Changes in Staff.—On April 7th, Mr. J. C. Coates, ward inspector for Bramley, having been selected for the post of nuisance inspector and surveyor to the Rural Sanitary Authority of Pottersbury, Bucks, sent in his resignation to the Sanitary Committee. It was accepted, and he left us on 22nd April, 1893. Mr. Coates had been with us from about the middle of 1889. Before coming to us he had been employed in the building trade, and held a certificate in building construction from the Science and Art Department of South Kensington. In 1892, after attending a course of lectures to sanitary inspectors at Wakefield, promoted by the County Council of the West Riding, and those of Bradford, Halifax, and Huddersfield, and to which the Sanitary Committee of Leeds franked such of our inspectors as wished to work for a diploma, he went up for, and passed the inspectors' examination of the Sanitary Institute. Upon the 8th May the Sanitary Committee appointed Mr. James Coupe an assistant inspector. He commenced his duties in the Bramley Ward on the 12th May, 1893.

On 5th August, Mr. A. E. Clark, inspector for the East Ward, having been appointed nuisance inspector and surveyor to the Rural Sanitary Authority of Wetherby, left us to commence his duties. Mr. Clark came to us about the middle of 1887, and for two years had charge of the East Ward. Then, for two years more, he had charge of District IV., corresponding very nearly to the Brunswick Ward. On the re-arrangement of the staff in 1891 he was one of the selected candidates for the post of divisional inspector. When the districts were re-arranged, he was appointed to the East Ward, and had charge of the old Sanatorium at Ivy House. Mr. Clark held the registration certificate from the London Company of Plumbers. In 1892 he passed the inspectors' examination of the Sanitary Institute, after the course of lectures at Wakefield already referred to. On the 11th September, Mr. T. Borras was selected by the Committee to occupy the place vacated by Mr. Clark. Mr. Borras had the certificate of the Sanitary Institute before he came to us as a clerk in the Sanitary Office.

On the 4th November, Mr. Myles Morley, inspector for the North-East Ward, left us to become nuisance inspector to the Urban Sanitary Authority of North Bierley. Mr. Morley was appointed an assistant inspector about the end of 1887. He had charge of Bramley and Stanningley districts, and afterwards of No. VIII. district, consisting to a large extent of the North-East

TABLE I.

		Quarters. I.	II.	III.	IV.	City Total 1893.
	HOUSE INSPECTION.					
1.	Houses and premises completely examined on account of — Infective disease	717	760	970	709	3156
2.	Alleged nuisances	74	208	71	39	392
3.	House-to-house work	481	454	500	723	2158
4.	Houses and premises examined only as to — Occupants	24	97	81	176	378
5.	Buildings and Offices	265	350	169	258	1042
6.	Drainage	550	428	647	628	2253
7.	Number of houses wholly or partly examined	2111	2297	2438	2533	9379
8.	Total number of above houses where sanitary defects were found	1271	1239	1358	1313	5181
9.	Sanitary defects found in above houses	1502	1441	1618	1338	5899
	NUISANCES, &c.					
10.	Nuisances found in above or other houses:— Houses dirty	200	219	220	156	795
11.	,, overcrowded	57	68	63	61	249
12.	,, damp or dilapidated	205	55	71	117	448
13.	,, with defective eave-gutters or fall pipes	120	115	178	210	623
14.	,, badly drained	1014	868	1182	907	3971
15.	,, without sink drain	24	72	56	85	237
16.	,, badly lighted	7	1	9	3	20
17.	,, badly ventilated	4	2	1	6	13
18.	,, with defective or insufficient closet accommodation	913	949	989	681	3532
19.	,, with dirty closets	532	634	432	592	2190
20.	,, with drains, &c., temporarily stopped	357	386	214	241	1198
21.	,, with other nuisances	310	403	423	431	1567
22.	Total nuisances found in houses	3743	3772	3838	3490	14843
23.	No. of houses in which above nuisances were found	3342	3341	3388	3154	13225
24.	Street gullies stopped	763	633	462	246	2104
25.	Offensive accumulations	42	58	60	54	214
26.	Other outside nuisances	167	190	204	151	712
27.	Total nuisances found	4715	4653	4564	3941	17873
28.	Complaints unfounded	7	29	22	19	77
	OTHER WORK DONE.					
29.	Additional visits paid to houses for — Infective disease	15310	9804	1420	4841	31375
30.	Nuisances found	748	618	931	1430	3727
31.	Completion of Reports	306	322	292	184	1104
32.	Other causes	1982	1997	2009	2888	8876

		Quarters. I.	II.	III.	IV.	City Total 1893.
	OTHER WORK DONE (continued).					
33.	Special examinations of drains by tests	418	406	453	568	1845
34.	Defects found by ditto	370	317	400	492	1579
37.	Appointments	291	256	374	333	1254
38.	Notices and letters served	728	168	121	120	1137
39.	Dwelling houses unfit for human habitation closed	10	3	..	26	39
40.	Dwelling houses rendered fit for human habitation	9	48	26	14	97
41.	Houses cleansed	198	216	153	138	705
42.	Overcrowded houses dealt with	33	42	58	47	180
43.	Defective spouting, &c., repaired	73	135	143	156	507
44.	New midden privies built	10	3	..	21	34
45.	Old midden privies repaired	43	28	61	88	220
46.	Do. rebuilt	5	13	6	6	30
47.	Privies converted into trough water closets	70	55	41	46	212
48.	Do. do. ordinary water closets	84	53	76	69	282
49.	Water closets erected	16	14	13	29	72
50.	New dry ashpits or tubs	64	71	53	60	248
51.	New trough water closets built	40	37	30	24	131
52.	Pail closets converted into water closets	9	20	11	17	57
53.	Do. altered into privies	..	..	..	6	6
54.	Closets cleansed (lime-washed, &c.)	105	384	290	418	1197
55.	Drains in course of construction inspected	279	239	202	232	952
56	,, ,, of reconstruction ,,	564	511	386	503	1964
57.	,, inspected when connection made to sewer	157	158	97	116	528
58.	Disconnections of house drains effected	913	899	790	752	3354
59.	Cesspools filled up	2	2	4	8	16
60.	Public or private wells abolished	..	..	..	3	3
61.	Houses supplied with town's water	8	16	6	10	40
62.	Trough and water closets repaired	225	164	177	228	794
63.	Other house nuisances remedied	517	523	455	617	2112
64.	Total houses for which above work done	2835	2775	2693	3050	11353
65.	Houses in which all defects found have been remedied	534	449	711	771	2465
66.	Street gullies cleansed	506	570	477	293	1846
67.	Offensive accumulations removed	71	56	46	67	240
68.	Pollutions of river or streams remedied	1	30	8	6	45
69.	Other non-domestic nuisances removed	130	97	83	94	404
70.	Additional visits paid to inspect work in progress	4017	3291	3159	3707	14174
71.	Total nuisances abated	4090	4105	3812	3952	15959

TABLE 1a.

House Enquiry about Small-pox during 1893.

Eastern Division. **Western Division.**

Central.	North.	N. East	East.	South.	East Hunslet.	West Hunslet.	Holbeck.	Division Total.	Inspector, and Ward in Charge of.	Division Total.	Mill Hill.	West.	North-West.	Brunswick	New Wortley.	Armley & Wortley.	Bramley.	Heading-ley.	City Total.
332	...	417	123	..	...	...	...	872	Maude, Central	...	...	...	...	...	...	...	...	...	872
40	1,589	...	36	...	...	...	...	1,665	W. M. Coates, North	...	...	...	...	...	...	...	...	...	1,665
203	137	1,015	369	...	...	...	...	1,521 203	Morley and Sharp, North-East	...	...	...	...	...	...	...	...	...	1,724
...	127	381	537	...	...	...	...	903 142	Clark and Borras, East	...	...	...	...	...	...	...	...	...	1,045
...	...	...	...	395	...	118	43	556	M'Caragher, South	..	...	...	...	...	...	...	...	...	556
...	...	...	...	...	233	...	...	233	Thornber, East Hunslet ...	...	...	...	...	...	...	...	...	...	233
...	...	...	...	...	...	643	66	709	Newby, West Hunslet	...	...	...	...	...	...	...	...	...	709
...	...	...	...	...	...	...	106	106	Booker, Holbeck	...	...	...	...	...	...	...	...	...	106
...	...	...	...	...	...	...	...	...	Hick, Mill Hill	3,403	...	2,102	...	1,008	62	160	...	71	3,403
...	...	...	...	...	...	...	...	...	Tindell, West	1,019	...	758	...	195	...	...	...	66	1,019
...	...	...	...	...	...	...	...	...	Handley, North-West	592	...	...	...	592	...	...	...	...	592
...	...	...	...	...	...	...	...	...	Carter, Brunswick	1,339	...	...	...	1,339	...	...	...	...	1,339
...	...	...	...	...	...	...	...	...	Hart, New Wortley	1,925	...	1,210	...	323	77	315	...	...	1,925
...	...	...	...	...	...	...	...	...	Kitchen, Armley and Wortley ...	454	...	...	...	117	...	337	...	...	454
...	...	...	...	...	...	...	...	...	J. C. Coates and Coupe, Bramley	526 593	...	443	...	...	83	93	500	...	1,119
...	...	...	...	...	...	...	...	...	Newhouse, Headingley	408	...	226	...	...	...	...	...	182	408
...	...	44	...	...	...	...	...	44	Lonsdale (Workshops) and Burton (Canal Boats)	332	...	...	...	332	...	...	...	...	376
575	1,853	1,813	1,065	395	233	761	215	6,954		10,591	...	4,739	...	3,906	222	905	500	319	17,545

Ward. Upon the re-arrangement of the districts in 1891 he became inspector for the North-East Ward. Before coming to us he had been a foreman bricklayer. He held certificates in building construction (advanced), freehand, and perspective drawing, and solid geometry from the Science and Art Department, and a technological certificate in brickwork and masonry (Arts and Crafts). Upon the 13th November Mr. Fred Sharp was appointed to the vacant inspectorship, and commenced his duties at once; he was already in the employment of the Corporation, having acted as a foreman in the ashpit cleansing department.

WORK OF WARD INSPECTORS.

Tables I., Ia., and II. contain some general and detailed information as to work done by the Ward Inspectors. Table I., as in the reports for 1891 and 1892, shews an analysis of the total work done during the year of fifty-two weeks, and each of its thirteen-week quarters. Table Ia., as last year, shews the visits paid by the Ward and two of the Special inspectors in search of cases of possible small-pox. The table is similar to the one given under the same heading in the report for 1892, but deals with the visits thus paid throughout the whole year. Table II. gives an analysis of work done in each division, and in each ward of such division, throughout the year.

Houses examined.—It will be seen on reference to line 7 (tables I. and II.), that the number of houses examined wholly or in part, but in any case more or less after a systematic manner, was 9,379. This is an increase of 1,232 upon the corresponding number in 1892, which it will be remembered was itself an increase of 2,277 upon the number dealt with in 1891.

The number of houses *wholly examined* (lines 1, 2, and 3) was 5,706, a decrease of 41 upon the number completely examined in 1892, but an increase of 1,374 upon the corresponding figures in the first three columns of the corresponding table for 1891. The number of houses completely examined on account of infectious disease in 1893 was greater than in either 1892 or 1891. The number of houses examined *completely* on account of nuisances alleged to exist in them was fewer than in either 1892 or 1891. In 1892 it was 1,016, and in 1891, 504. Last year it fell to 392. This fall has taken place along with a considerable increase of the number of houses *partially examined* as to the buildings and occupants, or as to the drainage. In the third line, dealing with house-to-house work, it will be noticed that the number of houses thus examined was fewer than in 1892, but considerably greater than in 1891.

In houses *partially examined*, either as to the number or condition of the occupants, the structural condition of the buildings and offices, or the conditions of the drainage, there has been an increase of more than 50 per cent. on the corresponding numbers for 1892, and more than 100 per cent. on those for 1891.

While, therefore, upon the whole, it may be considered that a larger amount of work has been done by the Ward inspectors in the way of examination of houses than in either 1892 or 1891, there has perhaps been a tendency to carry out the examination less completely. That is to say, while the number of houses examined completely, so far as certain particulars are concerned has increased, it has possibly done so somewhat at the expense of the still more complete examination in regard to all particulars, upon the importance of which I have previously laid so much stress. An instance will shew what is meant. A complaint is received, let us suppose from a medical man, that there is some reason to suppose a house is unhealthy. The inspector is instructed to visit; he perhaps makes up his mind that the matter is entirely due to defective drainage, and makes a complete examination of the drainage arrangements, finds something wrong, has it put right, and considers the thing done with. His examination of this house is entered up under line 6. It would have been better, however, in such a case, had he carried his examination a little further and examined, for instance, the gas fittings, ascertained how many persons were occupying the rooms, and whether there was anything as to their habits inimical to health. Had he done so, and made a *complete examination* of the house and its occupants, the case would have been entered under line 2.

TABLE II.

Analysis of work done by District Inspectors in the several Wards.

Eastern Division.															52 weeks ended 30th December, 1893.				Western Division.											
						Central.	North.	N. East.	East.	South.	East Hunslet.	West Hunslet.	Holbeck.	Division.		.. .. WARDS.		Division.	Mill Hill.	West.	N. West.	Brunswick.	New Wortley.	Armley and Wortley.	Bramley.	Headingley.				City Total.
																HOUSE INSPECTION.														
..	..	..	..	..	..	168	251	267	266	253	229	198	204	1836	1.	Houses and premises completely examined on account of	Infective disease	1320	54	150	263	142	104	187	201	219	..	..	..	3,156
..	..	..	..	..	..	5	1	16	10	223	..	3	47	305	2.		Alleged nuisances	87	23	11	4	21	7	10	5	6	..	..	..	392
..	..	..	..	..	..	109	91	92	63	56	80	114	164	769	3.		House-to-house work ..	1389	468	141	38	210	292	107	130	3	..	..	..	2,158
..	..	..	..	..	..	20	..	4	74	50	..	5	189	342	4.	Houses and premises examined only as to	Occupants	36	..	4	..	..	..	27	3	2	..	..	..	378
..	..	..	..	..	..	134	..	1	26	258	..	6	368	793	5.		Buildings and Offices ..	249	..	..	..	.	..	180	57	12	..	..	..	1,042
..	..	..	..	..	..	141	10	28	191	237	75	123	381	1186	6.		Drainage	1067	..	142	408	103	84	242	43	45	..	..	..	2,253
..	..	..	..	..	..	577	353	408	630	1077	384	449	1353	5231	7.	Number of houses wholly or partly examined ..		4148	545	448	713	476	487	753	439	287	..	..	..	9,379
..	..	..	..	..	..	266	78	251	472	492	186	260	1060	3065	8.	Total number of above houses where sanitary defects were found		2116	298	362	361	389	31	451	169	55	..	..	..	5,181
..	..	..	..	..	..	272	73	385	384	507	194	283	1386	3484	9.	Sanitary defects found in above houses		2415	323	396	482	466	28	469	190	61	..	..	..	5,899
																NUISANCES, &c.														
..	..	..	..	..	..	24	10	310	126	76	60	10	64	680	10.	Nuisances found in above or other houses—	Houses dirty	115	13	44	14	14	10	6	7	7	..	..	..	795
..	..	..	..	..	..	11	6	25	32	26	32	4	53	189	11.		,, overcrowded	60	6	13	8	10	2	6	14	1	..	..	..	249
..	..	..	..	..	..	18	17	6	147	47	44	42	34	355	12.		,, damp or dilapidated	93	8	12	6	41	13	2	10	1	..	..	..	448
..	..	..	..	..	..	16	2	47	40	28	166	67	10	376	13.		,, with defective eave-gutters or fall pipes	247	16	5	61	23	19	6	109	8	..	..	..	623
..	..	..	..	..	..	180	175	257	322	113	290	279	545	2161	14.		,, badly drained	1810	269	381	236	350	43	233	210	88	..	..	..	3,971
..	..	..	..	..	..	14	..	33	55	12	..	7	22	143	15.		,, without sink drain	94	19	6	21	1	..	4	38	5	..	..	..	237
..	..	..	..	..	..	6	..	6	..	1	5	..	..	18	16.		,, badly lighted	2	..	..	1	1	..	..	..	..	..	..	..	20
..	..	..	..	..	..	..	..	..	..	1	8	..	..	9	17.		,, badly ventilated	4	..	1	..	..	..	..	3	..	..	..	..	13
..	..	..	..	..	..	177	124	183	384	343	367	184	249	2011	18.		,, with defective or insufficient closet accommodation ..	1521	114	132	205	258	187	184	318	123	..	..	..	3,532
..	..	..	..	..	..	134	63	280	343	546	155	55	261	1837	19.		,, with dirty closets	353	39	97	41	20	45	25	76	10	..	..	..	2,190
..	..	..	..	..	..	119	104	25	42	211	99	116	79	795	20.		,, with drains, &c., temporarily stopped	403	30	72	27	34	68	49	42	81	..	..	..	1,198
..	..	..	..	..	..	142	144	34	78	93	357	137	135	1120	21.		,, with other nuisances	447	80	27	101	49	32	57	58	43	..	..	..	1,567
..	..	..	..	..	..	841	645	1206	1569	1497	1583	901	1452	9694	22.	Total nuisances found in houses		5149	594	790	721	801	419	572	885	367	..	..	..	14,843
..	..	..	..	..	..	837	639	961	1379	1465	1385	816	1121	8603	23.	No. of houses in which above nuisances were found		4622	532	762	480	712	401	549	860	326	..	..	..	13,225
..	..	..	..	..	..	56	77	92	62	149	343	199	638	1616	24.	Street gullies stopped		488	37	26	59	41	111	77	106	31	..	..	..	2,104
..	..	..	..	..	..	9	6	12	11	19	42	37	11	147	25.	Offensive accumulations		67	10	10	3	4	7	3	20	10	..	..	..	214
..	..	..	..	..	..	7	130	116	87	22	39	59	65	525	26.	Other outside nuisances		187	12	43	9	30	21	12	24	36	..	..	..	712
..	..	..	..	..	..	913	858	1426	1729	1687	2007	1196	2166	11982	27.	Total nuisances found		5891	653	869	792	876	558	664	1035	444	..	..	..	17,873
..	..	..	..	..	..	..	..	16	1	..	3	..	..	20	28.	Complaints unfounded		57	5	8	4	..	2	6	9	23	..	..	..	77

TABLE II—*continued.*

						Central.	North.	N. East.	East.	South.	East Hunslet.	West Hunslet.	Holbeck.	Division.	.. .. WARDS.	Division.	Mill Hill.	West.	N. West.	Brunswick.	New Wortley.	Armley and Wortley.	Bramley.	Headingley.				City Total.
															OTHER WORK DONE.													
..	..	..	..	..	..	449	3126	5883	1511	672	1131	1461	904	15137	29. Additional visits paid to houses for Infective disease	16238	341	5551	1539	5030	591	1288	857	1041	..	..	..	31 375
..	..	..	..	..	..	31	3	763	187	..	..	141	568	1693	30. Nuisances found	2034	303	..	176	36	300	72	610	537	..	..	..	3,727
..	..	..	..	..	..	34	..	456	71	72	..	390	3	1026	31. Completion of Reports	78	2	4	8	7	8	11	23	15	..	..	..	1,104
..	..	..	..	..	..	629	1707	756	201	16	1317	570	149	5345	32. Other causes	3531	382	1065	8	451	643	153	190	639	..	..	..	8.876
..	..	..	..	..	..	54	150	119	33	40	275	37	190	898	33. Special examinations of drains by tests	947	154	104	210	209	25	46	54	145	..	..	..	1,845
..	..	..	..	..	..	43	97	74	27	18	224	41	132	656	34. Defects found by ditto	923	90	142	152	372	12	38	43	74	..	..	..	1,579
..	..	..	..	..	..	58	89	156	29	40	19	10	96	497	37. Appointments	757	74	81	69	204	20	74	91	144	..	..	..	1,254
..	..	..	..	..	..	16	9	254	63	53	3	1	45	444	38. Notices and letters served	693	206	2	4	302	112	15	22	28	..	..	..	1,137
..	..	..	..	..	..	..	1	..	30	..	4	..	2	37	39. Dwelling houses unfit for human habitation closed..	2	..	2	..	..	..	..	..	..	..	..	..	39
..	..	..	..	..	..	..	1	11	39	4	26	..	..	81	40. Dwelling houses rendered fit for human habitation..	16	5	11	..	..	..	..	..	..	..	..	..	97
..	..	..	..	..	..	14	5	273	95	98	48	23	33	589	41. Houses cleansed	116	4	79	3	10	6	..	7	7	..	..	..	705
..	..	..	..	..	..	7	7	25	22	22	25	15	10	133	42. Overcrowded houses dealt with	47	6	13	2	7	..	2	17	..	..	..	..	180
..	..	..	..	..	..	5	..	40	23	37	129	132	26	392	43. Defective spouting, &c., repaired	115	14	14	1	42	7	..	34	3	..	..	..	507
..	..	..	..	..	..	..	..	1	..	..	7	5	..	13	44. New midden privies built	21	1	..	..	..	..	..	20	..	..	..	..	34
..	..	..	..	..	..	..	2	6	17	7	50	27	3	112	45. Old midden privies repaired	108	..	3	3	1	6	7	83	5	..	..	..	220
..	..	..	..	..	..	..	1	2	..	..	10	..	..	13	46. Do. rebuilt	17	..	..	..	..	2	1	14	..	..	..	..	30
..	..	..	..	..	..	11	6	14	16	11	16	4	29	107	47. Privies converted into trough water closets	105	..	3	35	10	29	28	..	..	..	..	..	212
..	..	..	..	..	..	16	8	11	4	4	4	8	29	84	48. Do. do. ordinary water closets ..	198	2	20	50	65	13	4	5	39	..	..	..	282
..	..	..	..	..	..	4	2	..	5	..	1	26	3	41	49. Water closets erected	31	5	5	8	11	..	..	..	2	..	..	..	72
..	..	..	..	..	..	19	11	13	19	..	5	18	28	113	50. New dry ashpits or tubs	135	4	19	22	60	23	..	..	7	..	..	..	248
..	..	..	..	..	..	1	7	..	65	7	..	11	..	91	51. New trough water closets built	40	4	4	6	13	9	3	..	1	..	..	..	131
..	..	..	..	..	..	2	4	5	24	2	..	2	..	39	52. Pail closets converted into water closets	18	..	3	1	8	..	4	..	2	..	..	..	57
..	..	..	..	..	..	..	..	..	..	..	..	6	..	6	53. Do altered into privies..	..	..	..	..	..	..	..	..	..	..	..	..	6
..	..	..	..	..	..	129	14	94	144	393	79	80	60	993	54. Closets cleansed (lime-washed, &c.)	204	16	61	22	6	9	62	28	..	..	..	..	1,197
..	..	..	..	..	..	170	31	38	82	52	60	73	16	522	55. Drains in course of construction inspected	430	82	41	17	144	30	64	22	30	..	..	..	952
..	..	..	..	..	..	58	34	133	123	191	29	50	140	758	56. Do. do. of reconstruction do.	1206	74	184	21	687	108	46	33	53	..	..	..	1,964
..	..	..	..	..	..	67	28	16	31	31	26	40	16	255	57. Do. inspected when connection made to sewer ..	273	28	24	39	61	8	80	3	30	..	..	..	528
..	..	..	..	..	..	113	167	176	334	100	220	200	177	1487	58. Disconnections of house drains effected	1867	158	354	356	607	93	144	68	87	..	..	..	3,354
..	..	..	..	..	..	..	..	..	..	4	..	2	..	6	59. Cesspools filled up	10	8	..	..	..	..	2	..	..	..	..	..	16
..	..	..	..	..	..	..	..	..	..	2	..	..	..	2	60. Public or private wells abolished	1	..	..	1	..	..	..	..	..	..	..	..	3
..	..	..	..	..	..	..	..	1	10	7	11	5	4	38	61. Houses supplied with town s water	2	..	..	..	..	1	..	1	..	..	..	..	40
..	..	..	..	..	..	82	25	55	63	94	107	63	37	526	62. Trough and water closets repaired	268	26	118	18	..	51	4	2	49	..	..	..	794
..	..	..	..	..	..	41	182	68	80	98	438	331	138	1376	63. Other house nuisances remedied	736	55	72	78	191	103	40	161	36	..	..	..	2,112
..	..	..	..	..	..	729	440	881	1154	1358	842	993	635	7032	64. Total houses for which above work done	4321	414	777	659	705	391	406	674	295	..	..	..	11,353
..	..	..	..	..	..	40	64	215	265	3	475	30	5	1097	65. Houses in which all defects found have been remedied	1368	147	189	..	289	331	12	325	75	..	..	..	2,465
..	..	..	..	..	..	6	81	96	52	138	321	211	626	1531	66. Street gullies cleansed	315	36	39	33	33	..	53	91	30	..	..	..	1,846
..	..	..	..	..	..	11	5	9	23	22	31	73	4	178	67. Offensive accumulations removed	62	11	10	1	6	3	4	18	9	..	..	..	240
..	..	..	..	..	..	..	8	..	..	..	4	22	..	34	68. Pollutions of river or streams remedied	11	..	..	1	..	..	..	10	..	..	..	..	45
..	..	..	..	..	..	..	98	57	42	2	35	29	29	292	69. Other non-domestic nuisances removed	112	1	45	..	14	8	2	19	23	..	..	..	404
..	..	..	..	..	..	619	1052	877	891	463	793	925	1000	6620	70. Additional visits paid to inspect work in progress ..	7554	924	1088	1278	1675	549	566	469	1005	..	..	..	14,174
..	..	..	..	..	..	690	723	1190	1459	1575	1687	1351	1343	10018	71. Total nuisances abated	5941	551	1128	803	1370	491	452	784	362	..	..	..	15,959

The circumstance that, while the entries in line 2 have decreased in number, those in lines 4, 5, and 6 are increasing, is one which I cannot view without some little apprehension. In many cases, doubtless, an experienced inspector will at once detect the most important cause of ill-health, just as a medical man passing a person in the street would be able to make a good guess what was the matter with him. But just as a medical man, having arrived at a conclusion from outside appearances, and having ascertained after examination that this conclusion was, so far as it went, correct, would be wrong to stop there and refrain from examining his patient in other respects—just as, for instance, having made up his mind that a man had heart disease, and having ascertained by the stethescope that such was the case, he would be wrong if he refrained from examining the kidneys to see if they were also doing their work—so the inspector who, having ascertained that something is wrong with the drainage, does not also ascertain whether the house is damp, whether the rooms are kept clean, and so on, fails to some extent in his duty, and is apt to overlook some important condition.

Found unsafe.—The number of houses, wholly or partially examined, in which sanitary defects were found was 5,181, against 5,148 in 1892, and 4,307 in 1891. That is to say 55 per cent. of the houses examined, wholly or partially in 1893, were found sanitarily unsafe. Sixty-three per cent. of those examined in 1892, and 70 per cent. of those examined in 1891 were in a similar condition. It is, of course, to be expected that as our work goes on, and as we continuously examine increasing numbers of houses in which illness has occurred, and as we are continually remedying faults found, we shall find the percentage of such houses as are defective to decrease. But there is a risk if we do not examine the houses thoroughly that we may overlook serious sanitary defects. This supposition is rendered more probable if we take into account the next line in the table. In 5,181 houses inwhich some defect was found in 1893, there was an average of rather less than 1·14 defects in each house examined. The average the preceding year had been 1·27, and the year before 1·41. It is, of course, as just pointed out, to some extent, to be expected, that with the improvements we are continually effecting in the town, out of any number of houses examined there would now be fewer defects than formerly. It is to be feared, however, that a part of the decrease in the number of defects found per insanitary house may be due to the less complete examination carried out. It seems to me necessary to keep insisting that it is of more consequence to do a small amount of work well, than to cover a large amount of ground in a more superficial manner. There is also another reason why we should desire to have a complete rather than a partial examination of every house dealt with. Do what we will it is impossible to make ourselves quite agreeable to all landlords, but a landlord has a legitimate cause of complaint if, having made him disconnect his drains from the sewer one year, we come the next year and require him to convert his privy into a trough closet, when both improvements might have been carried out at less expense as part of one contract.

RIVERS POLLUTION.

During the year 171 causes of pollution were cut off from the streams. It is not, of course, to be expected, so far as

TABLE III.

Shewing the number of drains or sources of pollution diverted from the River Aire and its tributaries and connected to the town sewers.

DATE.	Mill, factory, house drains. stables, and pigstyes.	Water Closets.	Privies.	Trade pollutions.	Total.
Previous to Dec. 31st, 1892	4,930	199	208	21	5,358
During the 52 weeks ended Dec. 30th, 1893	147	10	11	3	171
Totals	5,077	209	219	24	5,529

domestic pollutions are concerned, that these numbers will increase as years go on. The whole subject of trade pollutions is so difficult, and occupies so much time, that it is not greatly to be regretted that there is a prospect of the Conservancy Board taking this matter entirely into their own hands.

WORKSHOPS.

During the year Mr. Lonsdale, who was appointed by you to deal with workshops, has made 593 visits. At these visits he found the ventilation on the whole satisfactory in 541 instances. He found that the workrooms were clean in 457

TABLE IV.

Table shewing the sanitary condition of workshops on register, and occupied during the 52 weeks ended December 30th, 1893.

Date.	No. of Visits made to Workshops.	Employees.			Ventilation.		Condition of Premises.				No. of Occupiers noticed for Dirty Premises.
							Rooms.		Closets.		
		Male.	Female.	Total.	Good.	Defective.	Clean.	Dirty.	Clean.	Dirty.	
4 weeks ended Jan. 28	87	500	440	940	70	17	77	10	67	20	10
4 weeks ended Feb. 25	50	497	1,167	1,664	40	10	47	3	40	10	3
5 weeks ended April 1	122	1,113	1,012	2,125	120	2	90	32	86	36	32
4 weeks ended ,, 29	40	131	209	340	39	1	30	10	30	10	10
5 weeks ended June 3	25	230	171	401	25	...	19	6	15	10	6
4 weeks ended July 1	20	131	330	461	20	...	15	5	13	7	5
4 weeks ended ,, 29	40	265	297	562	38	2	32	8	26	14	8
5 weeks ended Sept. 2	40	258	140	398	40	...	31	9	25	15	9
4 weeks ended ,, 30	23	200	140	340	21	2	17	6	16	7	6
4 weeks ended Oct. 28	66	361	298	659	59	7	52	14	42	24	14
5 weeks ended Dec. 2	31	193	176	369	28	3	18	13	14	17	13
4 weeks ended ,, 30	49	417	426	843	41	8	29	20	25	24	20
Total	593	4,296	4,806	9,102	541	52	457	136	399	194	136

out of 593 visits, and he had to give notice to the occupants to cleanse in 136 cases. The conveniences attached to these workshops were clean in 399, and dirty in 194. Notice, usually verbal, was given to the occupier. These figures deal only with the ordinary inspections of workshops already on the register, and they do not include 93 visits to bakehouses. The general information as to conditions found in each month of the year is given in table IV. It will be noticed that in the month of March the number of visits was considerably increased, as the inspector put off other work in order to accompany Miss Collett, sent down by the Home Office.

In table V. will be found, also for each month, the visits paid to workshops coming newly on the list, and the conditions of the premises found at those visits. It is not to be taken that these conditions remain, as where they were faulty the inspector in many cases had them altered. The new workshops visited were 134; of these 40 were entirely without drainage; the drainage, such as it was, was out of order in one case. Disconnection from the sewer had been effected in 48 instances, not effected in 45. Not every one of the undisconnected workshops was put right, but usually the drains when not cut off were tested.

The closet arrangements found were as follows:—Inside water closets existed in 70, or just a little more than half of the workshops examined, the soil-pipe was carried up its full size above the roof in 44, this was not done in 26. Fifty-one workshops had water closet arrangements outside, and 13, privies. Privies were less common amongst the new workshops examined last year than in the year before.

In addition to the work so tabulated the inspector made other visits to workshops and factories, inquiring as to the wages of persons who were remaining away from work on account of infection in their houses. Such visits included 37 to workshops and 109 to factories. In addition, he made 238 visits to see that work ordered was being done, and 225 for the purpose of inspecting closets and drains. He also made 97 tests of drains, and in addition to these assisted the Ward inspectors, as has been already mentioned, in visiting various parts of the town where small-pox had occurred. He also made 151 visits to workshops or factories, inquiring as to cases of an infective character, thus making a total of additional visits of one kind or another, not contained in the printed table, of 950. During the year, in consequence of his action, 125 nuisances were abated; these are not included in tables I. and II. dealing with the work of the Ward inspectors.

BAKEHOUSES.

The number of bakehouses in the several wards was given in the report for 1892, and does not need to be reprinted, The Ward inspectors made 301 visits to bakehouses during the year, as follows:—Central, 19; North, 10; North-East, 5; East, 14; South, 51; West Hunslet, 38; Holbeck, 7; Mill Hill, 53; North-West, 9; Brunswick, 42; New Wortley, 34; Armley and Wortley, 4; and Headingley, 15. Total, 301. In addition to these, the Workshops inspector, as already said, made 93 inspections as follows:—Central, 41; East, 20; Mill Hill, 13; West, 10; Brunswick, 9.

HOUSE REFUSE REMOVAL.

The Nuisance inspector reports that the general condition of the ashpits in the city has been good. It will be noticed that while the requisitions sent to the general office by the ashpit department were a little less, the number of ashpits reported as not cleansed within four days were considerably fewer, amounting to 99 only. I have again to remind you that in regard even to these 99, the delay usually arose from some mistake in the address, and also in regard to the 8,332 that this number includes ashpits put on for cleansing on account of the occurrence of infective disease. Those so put on amounted to 3,755. The way in which this comes about is, as stated in the 1892 report, as follows:—"On our hearing of a death from any of the seven commoner zymotic diseases, or from croup, pneumonia, pleurisy, influenza, erysipelas, pyœmia, or puerperal fever, and in such cases of these diseases as we hear of during life, the ashpit is entered on the sheet for emptying, however

TABLE V.

Shewing the number of workshops not previously visited, to which visits have been paid, and the sanitary arrangements at time of visit.

DATE.	No. of different Workshops visited.	DESCRIPTION OF DRAINAGE.				SITUATION OF CLOSETS.				No. of Shops found Closed.
						Inside.		Outside.		
		Cut Off.	Not Cut Off.	Without.	Out of Order.	W.C. soil-pipe carried up.	W.C. soil-pipe not carried up.	W.C.'s.	Privies.	
4 weeks ended Jan. 28	5	2	1	1	1	2	1	2	...	5
4 weeks ended Feb. 25	9	3	3	3	...	3	2	2	2	9
5 weeks ended April 1	2	1	1	...	...	2	...	...	...	8
4 weeks ended ,, 29	16	6	4	6	...	4	3	7	2	3
5 weeks ended June 3	...	...	...	...	...	...	...	...	...	4
4 weeks ended July 1	20	5	7	8	...	6	4	8	2	5
4 weeks ended ,, 29	8	8	...	...	...	5	...	2	1	2
5 weeks ended Sept. 2	7	2	3	2	...	2	1	3	1	6
4 weeks ended ,, 30	11	6	3	2	...	5	2	3	1	8
4 weeks ended Oct. 28	19	3	9	7	...	2	3	13	1	6
5 weeks ended Dec. 2	23	9	10	4	...	10	4	6	3	5
4 weeks ended ,, 30	14	3	4	7	...	3	6	5	...	5
Total	134	48	45	40	1	44	26	51	13	66

short may be the interval since it was cleansed before. The "cases" as distinguished from deaths are not very numerous, except in scarlet and typhoid fevers. Practically, of the other diseases, it is on account of death that the ashpit is ordered to be emptied. This practice runs up the number of requisitions sent from the Inspectorial to the Cleansing Sub-Department, and requires to be allowed for in estimating the value of the table."

TABLE VI.

Ashpits inspected during the fifty-two weeks ended 30th December, 1893.

Number of ashpits inspected.	Requisitions to cleanse sent to Refuse Removal Department from Sanitary Office.	Number of latter returned as carried out.	Ashpits not cleansed within four days of requisition.	Condition of ashpits generally.
82,312	8,332	8,098	99	Good.

Mr. Darley has furnished me also with table VII., shewing work done by his staff. It will be noticed that the emptying of middens took place to the extent of some 4,000 more than last year. Similarly the number of emptyings of dry ashpits or tubs were 62,000 more in 1893 than in 1892. On the other hand the diminution in the number of emptyings of boxes and pails (which are gradually being got rid of) reduced the total number of emptyings in the third column by 56,000; each pail counting of course many times. The total number of receptacle emptyings, therefore, was only increased by some 10,000, but it is to be remembered that this increase was of the larger receptacles, the decrease having been in the emptyings of smaller ones. The total number of loads removed was some 6,300 less than in the previous year, which had, also, 5,708 fewer than in 1891. The reason of this decrease was to a large extent due to the larger carts used.

TABLE VII.

No. of middens emptied.	No. of dry ashpits or tubs emptied.	No. of boxes or pails emptied.	Total.	LOADS REMOVED.			Total.
				Night-soil.	Dry ashes.	Rubbish.	
77,773	262,941	169,996	510,710	36,387	59,307	17,713	113,407

DESTRUCTORS.

From January 2nd to December 31st, 1893, 19,282 loads of rubbish, weighing nearly 20,696 tons, and averaging 21·4 cwts. (= 1·07 tons) per load, were destroyed in the 12 cells at Armley

Road. The daily average rubbish consumed, therefore, was 68·08 tons, a little more than 5·67 tons per cell per day. There were 6,558 observations taken of the temperature by the pyrometer. They varied from 400° Fahr. to 1,500°, above which point our pyrometers do not register. Counting the highest observations as 1,500°, the average was 1,087°.

At Beckett Street the quantity of rubbish consumed was 11,754 loads, weighing 12,606 tons, averaging 21·4 cwts. (=1·07 tons) per load. The daily amount of refuse destroyed was 41·47 tons for 304 working days. The average work per cell was, therefore, 2·96 tons per day. The average observed temperature was 898° Fahr., the highest 1,500°, and the lowest 200° Fahr. There were 4,629 observations taken.

For some 20 weeks this destructor was not working in full swing. The material which would ordinarily have gone to it was being tipped at the East End Park, partly to improve the Park and partly to find work for the unemployed. This accounts not only for the smaller quantity consumed, but also for the lower temperature. If we deduct these 20 weeks in which the fires of the destructor were only kept alive, the average destruction of refuse was 3·5 tons per cell. Even this does not fully explain the less amount of work credited to the destructors. The 20 weeks of idleness were not weeks of ordinarily average consumption, but weeks when ordinarily the destructor would have been working at its best.

At Kidacre Street 20,449 loads of rubbish, weighing nearly 19,671 tons, was destroyed in 304 working days. Each load weighed 19·2 cwt. (0·96 tons), or an average of 64·7 tons per day and 6·5 tons per cell-day. There were 6,690 thermal observations taken, the highest being 1,500° Fahr., the lowest 700°, and the average of the 6,690 observations 1,397° Fahr.

There were also destroyed, at one or other of the three destructors, unsound fish, potatoes, apples, cockles, jam, yeast, and offal, weighing 41 tons. In addition to this we burnt 65 mattresses, 2 beds, 2,500 eggs, the carcases of 529 dogs, 33 cats, 44 pigs, 12 beasts, 3 calves, 1 horse, 2 foals, 23 sheep, 2 goats, 70 rabbits, 4 hares, and 1 donkey, which were not weighed; these are generally not counted in the totals of house refuse destroyed.

Some observations were taken during the year in regard to quantities and cost, but as they were not completed in 1893, and are still being continued, it will be better to deal with them in another report. I am happy to say that now the more exact weighing of the refuse, which I have always desiderated, is being carried out.

TABLE VIII.

Shewing cowsheds and milkshops on register.

Cowsheds on the register	199
Milkshops	339
Visits to both	936
Applications for registration	22
Notices served to discontinue business ...	2

STREET CLEANSING.

Superintendent Hanford reports that work corresponding to the cleansing of 169,809 streets, or 9,700 above the record of last year, was carried out during the 312 working days of 1893. This corresponds to an average of 544 street cleansings a day. The cleansing of street gullies was represented by work equivalent to dealing with 173,661 gullies (or 49,352 more than in 1892). The number dealt with corresponds to an average of 557 per day.

It will be remembered that a special effort was made to cleanse the offensive gullies in the South-East district, particularly during the hot summer months. These gullies are used as reservoirs for the preservation of sewage by the occupants of back-to-back houses, and even the more frequent cleansing adopted, fraught as it has evidently been with good results in this district, the only one in which the diarrhœa death-rate did not increase last autumn, is less frequent than is advisable. It would be well to have a more frequent cleansing of gullies carried out throughout the town. This matter is referred to under the head of diarrhœa (page 138), and again in the fifth part of this report.

Horses were employed for scavenging purposes for 14,711 days' work, and street watering represented 2,306 horse days, an average respectively of 41·1 and 7·4 horses per day. The three ponies collected 2,163 loads of horse droppings, at a cost of £216 4s. 2d. The whole cost of the sub-department during the 312 working days was £13,883 2s. 1d., or an average of £44 9s. 11d. per day.

TABLE IXa.

Summonses issued under the Sale of Food and Drugs Act, 1875—9, during the year 1893.

No. of Sample.	Article.	Percentage of Adulteration.	Fines.		
			£	s.	d.
21	Milk	33% added water	1	0	0
30	Do.	32% do.			
31	Lard	60% Foreign fat	5	0	0
32	Do.	57% do.	2	10	0
43	Do.	54% do.	2	10	0
71	Milk	16% added water	5	0	0
107	Do.	16% do.	5	0	0
119	Cheese	Fat other than butter fat	10	0	0
157	Milk	10% added water	5	0	0
158	Do.	9% do.			
162	Do.	16% do.	1	0	0
168	Do.	22% do.	1	0	0
228	Do.	16% do.	2	0	0
239	Do.	14% do.	4	0	0
			£44	0	0

TABLE IX.

Samples of food sent to the City Analyst for examination during the 52 weeks ended 30th December 1893.

Article.	Genuine.	Poor in quality.	Adulterated.	Total.	Summoned.	Convicted.	Dismissed.
Milk	104	23	13	140	8	8	...
Butter	6	...	2	8	...	..	...
Lard	9	..	11	20	3	3	...
Cheese	11	...	4	15	1	1	...
Flour	1	...	...	1	...	...	...
German Yeast ...	3	...	...	3	...	...	...
Pepper	2	...	...	2	...	...	...
Mustard ...	1	...	1	2	...	...	...
Vinegar... ...	8	...	2	10	...	...	...
Baking Powder...	3	...	...	3	...	...	...
Coffee	2	...	...	2	...	...	...
Ground Ginger...	1	...	...	1	...	...	...
Olive Oil ...	1	...	...	1	...	...	...
Sedlitz Powder...	2	...	...	2	...	...	...
Bottled Peas ...	...	...	3	3	...	...	...
Ale	...	...	1	1	...	...	...
Soda Water ...	6	...	5	11	...	...	...
Cream of Tartar	1	...	...	1	...	...	...
Tinned Salmon & Lobster ...	...	...	3	3	...	...	...
Glycerine ...	3	...	5	8	...	...	...
Total ...	164	23	50	237	12	12	...

DAIRIES AND COWSHEDS AND FOOD AND DRUGS.

The number of cowsheds on the register has been increased by seven; that of milkshops slightly decreased. The visits made were 200 more than in the previous year.

Mr. Walker has also been diligent in looking after the purity of food and drugs. Out of 237 samples sent to the Analyst 164 were returned as genuine, 23 (all milks) as of low quality, which is the official form of saying that water has been added to reduce ordinary milk to a level that no cow with a conscience could produce. Fifty articles were unmistakably adulterated ; some of these were test specimens, taken informally, in order to ascertain whether adulteration was being practised. In twelve cases of adulteration the specimen had been taken with all due formality, the dealers have been prosecuted, and the magistrates inflicted fines amounting to £44. The particular cases and the amount of fine are given in table IXa. In addition to this work proceedings were taken and convictions obtained in four cases for supplying margarine without proper label, and fines amounting to £8 10s. were inflicted. For refusing to sell milk to the inspector a person was summoned and fined £1.

SLAUGHTER-HOUSES AND MEAT INSPECTION.

During the year the two Meat inspectors made 6,235 visits to registered slaughter-houses. There are 130 of these on the roll. These visits do not include their inspections of meat shops. One official seizure of 8½ stones of pork was made: the owner was summoned and fined £10. A fine of £2 10s. was also inflicted on a butcher for slaughtering in unregistered premises. As already said, a considerable quantity of meat was destroyed at the instance of the owners. This is not included in table X. The attention of the inspectors was called to some 1,674 stones before it was sent away. It is, of course, the duty of the owner himself to destroy any meat that is unfit for food, and we are always willing to afford facilities for his doing so at the destructors. It is not the duty of our Meat inspectors to offer any opinion as to the desirability of destroying or not destroying such meat. If they find meat exposed for sale, or in process of preparation for sale, which is unfit for food, it is their duty to inform the Nuisance inspector or myself, in order that an official seizure may at once be made. There is no analogy

TABLE X.

Slaughter House and Meat Inspection, Fifty-two Weeks ended 30th December, 1893.

Class of Meat seized and destroyed.	Weight in stones of 14 lb.	Official seizures.	No. of persons summoned.	No. of convictions.	Penalties.
Beef	...	...	...	...	...
Mutton ...	...	...	...	...	...
Pork	8½	1	1	1	£10 0s. 0d.
Veal	...	...	...	...	...
Fish	...	...	...	...	..
Game... ...	...	...	...	...	...
Fruit	...	...	...	...	...
Totals ...	8½	1	1	1	£10 0s. 0d.

between the work of the Building inspector, who has to pass premises before they are allowed to be used as dwellings, and that of the Meat inspectors. If it were our duty to see every piece of meat that is sold, the work would be simply impossible. A meat salesman is supposed to be an expert, who can detect unsound meat. It is his duty to do so, and at once remove it from his premises. It is our duty, if we find it there, to seize and ask the Magistrate to condemn it.

SMOKE INSPECTION.

In the Smoke Inspector's Report it will be found that the number of furnaces inspected was a little less than in 1892, though 800 more than the year before; the number of observations, each one hour long, was some hundred less. The average emission of dense smoke found was practically the same as in the two previous years. The number of new appliances was

TABLE XI.

Smoke Inspector's Report.

Complaints received	9
Furnaces inspected	6,066
Observations taken of chimneys (for a period of sixty minutes each)	1,722
Average minutes of dense smoke emitted during each observation of one hour's duration...	2·2
Total number of minutes' dense smoke	3,755
Smoke prevention appliances adapted to furnaces ...	81
Chimneys newly erected	11
Furnaces in connection with above	16
Notices served upon manufacturers	16
Do. do. stokers	17
Persons summoned before the magistrates	10
Do. convicted	4
Total amount in fines ... £8 0s. 0d.	

somewhat fewer than in either 1891 or 1892. The number of new chimneys was practically the same. The notices served upon manufacturers and stokers were also fewer, the summonses 10, against 12 in 1892, and 27 in 1891; convictions 4, against 9 and 25; the fines £8, against £11 10s. and £26 15s.

DISINFECTION AND FLUSHING.

Table XII. gives the usual statement about the work done by the disinfecting staff. About 350 more houses, and 1,550 more rooms were subjected to disinfecting processes than in the previous year. There was a decrease of nearly 1,750 in the number of beds and mattresses disinfected, but an increase of upwards of 1,500 in the articles of bed clothing so treated. The number of articles of wearing apparel so dealt with was nearly three times the number disinfected in the previous year, while other articles of a miscellaneous character were nearly double what they had been in 1892. It is unnecessary to repeat that the process adopted was pretty much as last year. Great importance is attached to the disinfecting of textile articles by steam. With very few exceptions, some 185,000 articles of this description were so disinfected; only a very few were treated by dry air or by other disinfectants.

Flushing.—Reference has been made to the cleansing of street gullies. Mr. Hanford has now for some three years had the management of the new flushing department. A cart is sent to every house in which it is known that any of the infective diseases mentioned at page 178 has occurred. The gullies round the house, and any found in the inside, and where practicable the water closets, are flushed with the hose-pipe, and afterwards treated with a strong solution of carbolic acid. During 1893 five flushing carts were employed for the whole, and a sixth for about half the year. Each cart has two men and a horse, and carries a certain short length of hose-pipe, and a quantity of disinfectants. The number of house drains flushed inside houses was upwards of 17,600, and of drains, outside houses, 79,760. In addition 156 drains, principally those outside the buildings, were flushed at schools, &c.

TABLE XII.

Work done by Disinfecting Staff.

Houses disinfected	1,505
Rooms "	4,871
Beds and mattresses disinfected	6,804
Articles of bed clothing	21,577
Articles of wearing apparel	129,096
Miscellaneous articles	34,726

REMOVAL OF FEVER CASES.

Table XIII. shews the amount of work done in removing persons to hospital. The number so removed was 284 in excess of last year's return. This excess was chiefly due to the increased number of patients reported as suffering from small-pox, 588, against 131 in the preceding year. On the other hand, the cases of scarlet fever were 198 against 441, but those of typhoid shewed an excess of 74 in 1893. It will be noticed that the number of small-pox cases removed does not correspond to the number admitted, which was 565. This is chiefly accounted

TABLE XIII.

Cases Removed to Hospital by our own Staff.

Small-pox.	Scarlet Fever.	Diphtheria.	Typhus Fever.	Typhoid Fever.	Other Diseases.	Total.
588	198	3	...	193	7	989

for in the following way, and the same remark applies to other diseases. If a case is reported as small-pox, or doubtful small-pox, it is removed to the small-pox hospital by the removal officers, and entered into their books as small-pox. If, however, there is any doubt about the nature of the case, or if the case is subsequently transferred to another ward, no correction is made in their returns. It has been thought better, therefore, to give in table XIV. the actual number of cases admitted. The cases under the different headings in this table are returned by the Resident Medical Officer as suffering from those diseases

TABLE XIV.

Return for the fifty-two weeks ended December 30th, 1893, of patients in hospital.

	1 Small-pox.	2 Scarlet Fever.	3 Diphtheria.	4 Typhus Fever.	5 Enteric, or Typhoid Fever.	6 Other or doubtful cases.	7 Total.
No. in Hospital on Saturday, 31st of Dec., 1892 ...	46	53	...	...	26	9	134
No. since admitted ...	565	192	2	1	186	99	1045
No. discharged	556	213	...	...	168	93	1030
No. died	30	6	2	1	25	8	72
No. remaining in Hospital, Dec. 30th, 1893	25	26	...	...	19	7	77

It is perhaps worth while to take this opportunity of pointing out that the greatest precautions are taken not to allow anyone to suffer from a mistake of the medical man who sees the patient first at home. Frequently the latter gives us information that he is in some sort of doubt about the case, and under these circumstances the patient is usually seen before being admitted to the ward at all. In a few cases of small-pox in which this was not done, the patient was at once vaccinated when there seemed a suspicion that the diagnosis might have been incorrect. Although I have expressed a doubt as to the power of vaccination performed several days after exposure to the infection of small-pox in preventing the development of the disease, there is less doubt about its preventive power when performed immediately after exposure to the disease. I would remind you, however, that in portioning out the new hospital it is desirable to provide amply for the accommodation of doubtful cases. It is perhaps repeating what has been frequently said, to point out that if a medical man, in some cases, keeps a patient at home until he is quite certain as to what is the nature of the disease, the risks that other members of the family will develop it are very great. In all such doubtful cases it is better to have a place for isolation and observation within our hospital precincts. The sanatorium cottages have been found occasionally useful for isolating cases about which there was some doubt as to whether they should be classed as variola or varicella.

CANAL BOATS, TEMPORARY DWELLINGS, &C.

The three remaining tables deal with canal boats, houses let in lodgings, and other work done by the Temporary Dwellings

TABLE XV.

Canal Boats.

Registered during the 52 weeks	6
Transfers to fresh owners	3
Struck off register	—
On register, December 30th, 1893	413
Visits of inspection	157

inspector. Mr. Burton was several times appointed by the Chief inspector to superintend the visits made to houses on account of small-pox by other members of the staff. Himself paid 44 such visits. During nearly seven months of 1893 he was in residence at the sanatorium cottages.

TABLE XVI.

Houses Let in Lodgings.

Registered during the year	—
Struck off register, removals, &c.	—
No. on register, December 31st, 1893	34
Visits of inspection	351

TABLE XVII.

Other work of Temporary Dwellings Inspector.

Visits of inspection to common lodging-houses ...	158
„ to overcrowded houses	6
„ houses as to drainage	22
„ „ small-pox...	44
„ as to pollutions of river Aire, &c.	28
Vans inspected	32
Tents „	—

PART V.—REPORTS AND RECOMMENDATIONS.

REPORTS.

Monthly.—During the year monthly reports have been made to the Sanitary Committee in reference to the health of the town. These have been accompanied by statistical tables shewing the total deaths in each Registration district, hospitals and public institutions being considered as separate districts; also the district and borough mortality at certain ages. The same table has also shewn the number of deaths from each of the seven zymotics, from croup, consumption, and accident ; the number of inquest cases, and the number of uncertified deaths. The table has also shewn for the borough and its districts the approximate population, the comparative annual mortality for the month for each 1,000 persons estimated as living, and the same for the corresponding period of the previous year. Attention has also been directed, from time to time, to special matters requiring the consideration of the Authority.

Weekly.—A smaller table has also been prepared shewing, for the borough as a whole, the number of zymotic cases and deaths, the deaths from pneumonia, and the cases removed to hospital each week. This information has been at the service of the press.

Quarterly.—The Committee has also received from me, in print, a more detailed statement of mortality, shewing the number of deaths and the approximate death-rate per 1,000 for each of the municipal wards of the borough during each quarter. In the same reports the birth-rates and the death-rates, not only from all causes, but also from the seven commoner zymotic diseases, for the registration sub-districts for the same periods of 13 weeks were given. There has also been laid before the Committee, each quarter, a printed statement, on a form similar to table II., of the work done in each ward of the borough by the District inspectors. A table similar to table F. has accompanied this report, and another with some of the details contained in table A.

Provisional Annual.—At the beginning of the present year, an abstract of the statistical tables, which will be found at greater length in an earlier portion of this report, was presented, shewing for the 52 weeks the mortality in each municipal ward and registration district of the city.

Hospital Extension.—The Hospitals Sub-Committee's report on their visits, mentioned in my last Annual, was completed and presented to the General Committee in October, 1893, and adopted.

It has been necessary also for me from time to time to report as to the spread of small-pox, and the accommodation of cases, and as already mentioned, the special attention of the Committee was drawn to the increase of the disease in the North-West Ward at their April meeting, and for the following meeting a lantern slide was prepared, shewing the localisation of the disease.

Street Gullies.—The matter of trapped gullies was discussed by the Sanitary Committee along with other matters on receipt of the report as to "Preparedness for Cholera" in 1892. A deputation of the Sanitary Committee waited upon the Streets and Sewerage Committee, urging them to abolish, in the paved streets, the deep catch-pits which exist generally throughout the town, a request that was not, at that time, acceded to.

In many rows of back-to-back houses these catch-pits are used by the occupiers for getting rid of their slops, and at all times, but especially in hot weather, the practice is a cause of great nuisance. These gullies are most of them about 30in. deep (16½in. below the outlet), with an horizontal section of 22in. by 15in., and retain nearly 20 gallons of the liquid filth thrown into them.

Three parts of a pailful of slops thrown into such a chamber merely shakes up its contents without in any degree flushing out the filth, and although some portion of the putrefying material is driven away, the greater part remains, and this small cesspool, close to the only door of the back-to-back cottage, seems to me to be a fruitful source of disease.

RECOMMENDATIONS.

Street Gullies.—I would therefore again urge upon the Committee the necessity of not allowing this matter of street gullies to slide. The City Engineer has pronounced them unnecessary in the paved streets. As was said last year, any words used to express, however inadequately, the offensiveness of these small cesspits, would sound like an exaggeration. Some little has already been done in this matter, but it is one that will require further attention from time to time.

Midden Privies.—I would also again draw the attention of the Committee to the necessity of getting rid of all the old deep wet ashpits. Even in the better parts of the town many privy middens of the old type remain, in the back streets, where they are used by the servants and as ashpits. They are exceedingly troublesome to the cleansing department, as they are often in locked yards, and can only be emptied on obtaining the key by previous arrangement with the tenants. Were these conveniences converted into water closets and dry ashpits, the latter would be cleansed during the day, and most of the complaints which come to the department of the non-cleansing of these receptacles would cease, as the necessity of previously applying for the key would be done away with. I again recommend, therefore, that all deep wet ashpits be entirely done away with. But it is not alone old-fashioned deep wet ashpits that are a nuisance. Complaints are continually reaching me from householders in various parts of the town of the nuisance caused by the necessary process of emptying more modern wet ashpits. In such streets as Third and Fourth Avenues, in New Wortley, where short streets of block-built back-to-backs have their ventilation impeded by long rows of back-to-back houses all round them, even the modern improved—Corporation approved—midden asserted itself in hot weather as a nuisance. And this nuisance became often intolerable when the turn for emptying came round. People tell me at these times they have to shut doors and windows, no matter how hot, to keep out the smell. Houses are being built daily in Leeds with closets of this objectionable kind, in parts of the town where, owing to the rapid closing in of the neighbourhood, they cannot fail shortly to become serious nuisances.

Trough Closets.—Although the trough water closet is a great improvement upon the old midden which it has superseded, and although these conveniences are now cleansed much more frequently and much more efficiently than when I drew your attention to them in my report on the measles outbreak at the end of 1890 and beginning of 1891, there still remains much to be desired.

Twenty-four hours is a very long time, in hot weather, to allow the matters to remain in these closets. Yet from Saturday to Monday they remain there for forty-eight. Some householders who have bedrooms over these conveniences complain bitterly of their offensiveness when discharged on Monday morning. It has to be remembered that though the emptying of the trough and use of the flushing-pipe is carried out, with the exception just named, pretty regularly every night, the completer cleansing by the brush is only done ordinarily about once a fortnight. This is more frequently than formerly, and the use of the hose-pipe is better attended to, but it will be understood that the sides of these receptacles, notwithstanding, become coated with offensive matters, which the hose-pipe will not altogether remove, and that new material is added, not to clean water, but to water in contact with matters already undergoing decomposition.

I should recommend that in hot weather these closets be emptied not less frequently than twice a day, and that a small quantity of sulphate of iron, or chloride of zinc, or other antiseptic, be added to the water.

Unpaved Streets.—Numerous streets in various parts of the town are still unpaved. This means also that they are uncleansed. Vegetable matters such as tea leaves are thrown out upon these streets, and remain there, as our brushes do not traverse them. The neighbourhood is thus also kept damp, not to mention the annoyance to passengers.

Undisconnected Drains.—I must again remind you that one of the most serious difficulties in making Leeds healthy arises from the large number of houses that are still connected to the drains. Something like two-thirds of the houses examined on account of illness are found to have some connection with the sewer. Specially would I draw your attention to the figures given at pp. 164, 165 of this report dealing with measles, shewing the influence of this kind of drainage. The principle of cutting off every house drain has been long admitted by the Corporation, but houses have been built, *even quite recently*, in which this principle has not been carried out.

Where there is a basement it is very common for the waste from the ground floor sink to pass by a leaden pipe into a narrow iron fall-pipe, and then by one or two lengths to a box trap under the cellar floor. This box trap is generally placed beneath the flag, and can only be cleansed by the removal of the latter. It is generally found when examined to contain a considerable amount of slimy material, offensive in the extreme, and the pipes connecting this box trap with the upper sink are frequently defective at the joints. The joint where the lead enters the iron is very apt to give way. The one where the pipe enters the box trap has also generally given way. As it is almost always leaky, emanations from the contents of the box trap have ample opportunity for entering the dwelling. It is now universally admitted, and requires no argument, that the proper way to deal with these houses is to take the ground floor sink waste pipe immediately through the wall to the outside, and there let it deliver over a gully trap, and at the same time do away altogether with any drain from the basement.

Where the cellar, however, is the wash kitchen, as is too often the case in back-to-back houses, it is not practicable entirely to dispense with some basement drain. In this case the method usually adopted is to abolish the drain in the floor and to take the waste of the basement sink to a gully in the area. This gully, however, is exceedingly difficult to cleanse, and if allowed to remain uncleansed is apt to become offensive, and the "fresh air" entering the basement has to come over it. A better plan is to make a special shaft for the gully, and to conduct the fall-pipe into it, thus leaving opportunity for air to reach the basement otherwise than immediately over the gully. Such gullies in shafts have been in use in Leeds, here and there, for several years, and they shew no special tendency to get stopped up.

Bye-Laws.—A joint Sub-Committee of the Building and of the Sanitary Committees met about four years ago to confer upon some of these matters. It was at that time proposed that new Bye-Laws should be applied for. Delay has occurred on account of the desire of the Corporation to consolidate all their local Acts. The passing of the Leeds Improvement Bill, 1893, has removed that cause of delay, and it seems greatly to be desired that the Corporation should now have power (1) To insist upon entire disconnection of every new house from the sewer; (2) to prescribe the kind of convenience which may be erected in any given district.

It will be remembered that in some parts of the town, before the meeting of the Sub-Committee mentioned, the Sanitary Committee were insisting upon the removal of midden privies on one side of the street, while the Building Clauses Committee were allowing the erection of new ones on the other. Though not many cases of this kind may have occurred very lately, the action of the Sanitary Committee is considerably hampered by the fact that middens are still erected in what the Building Clauses Committee themselves would, I believe, consider ineligible situations. That Committee seem to consider that they have no power under the present Bye-Laws to prescribe which kind of closet an owner shall erect. (3) The Authority should be able to insist that slaughter-houses should be erected under stringent Bye-Laws. At the present there are no Bye-Laws applying specially to new slaughter-houses.

Adoptive Acts.—The attention of the Committee has been drawn from time to time to certain sanitary Acts which have not been adopted by the Authority, viz., "The Infectious Disease (Prevention) Act, 1890," and "The Public Health Act, Amendment Act, 1890," part III. Practically, all the clauses asked for were included in the proposed Consolidation Bill, but were objected to on the ground that they formed part of the general law, and they were left for the Corporation to adopt in the ordinary manner. This has not yet been done, although the clauses referred to had received the sanction of the full Council as well as of the Sanitary Committee before they were placed in the draft of the Consolidation and Improvement Bill. Some rather amusing results follow from the non-adoption of these Acts. Recently the Hull authorities were zealously pursuing a vendor of bad eggs. Eggs are not meat under the Public Health Act, 1875, but are in the Amendment Act of 1890. The Hull vendor has only to visit Leeds, and if he does not enter our market, he may sell his bad eggs and no man make him afraid. Similarly, no matter how unwholesome a piece of meat sold to a citizen may be, the Public Health Act, 1875, gives no power to prosecute unless the meat has been seized by an officer of the Corporation and condemned by a magistrate. These and similar slips in the drafting of the 1875 Act are remedied in the Adoptive Acts of 1890, which, however, are not yet law in Leeds.

Insanitary Dwellings.—I have to draw your attention again to " Insanitary Area, No. 1," on which I reported at length in my Annuals for 1890 and 1891. In regard to this large area we are still going to begin.

Back-to-back Dwellings.—The Council are now in a position to refuse consent to the building of any back-to-back houses in future. Formerly, certain conditions complied with, they could not refuse their sanction to the erection of this objectionable class of dwelling. Now they can. The results of three years examinations of the houses in which 1,770 measles cases occurred, goes to shew that comparing the ratio of through houses to all death-houses, with the ratio of through to all recovery-houses, the proportion is as 100 throughs in a given number of death-houses, to 120 in the same number of recovery-houses. This proportion is based upon a much larger number of cases than I have yet been able to lay before you. The figures will be found at page 165 in Part III. of this Report.

CONCLUSION.

The year 1892 had been the healthiest on record. The two preceding years were comparatively times of adversity, influenza was present, and our death-rate was high. The rate in 1893, though below that of the two influenza years, was above our recent average. Some of the causes were transient. Some will, unless removed, have the same results when similar climatic conditions recur. Some of them I have already sufficiently indicated.

I have to report that the Chief Inspector and his staff have carried out their work during the year in an energetic and conscientious manner. A great amount of extra strain was put upon the department by the spring outbreak of measles, the severe autumnal diarrhœa, and the continued prevalence of small-pox. Every member of the sanitary staff willingly put himself about to prevent the spread of the latter disease, and I think the

Corporation have reason to be satisfied with the way in which Mr. Swallow, his two divisional inspectors, Mr. Mills, and Mr. Smith, his ward inspectors, the removal officers, and the disinfecting men threw themselves into the work while small-pox continued in our midst. It is unnecessary for me to say that Mrs. Doran and Mr. Pearson did their share of the extra work ungrumblingly and well.

To Mr. Darley and Mr. Hanford I feel that we are largely indebted for the improvement in the health of the town which I have been able to record. Both have taken a lively interest in the experiment in the South-East District. This experiment is still going on.

The Food and Drugs inspector, the Smoke inspector, and the other special inspectors have kept steadily and efficiently at their work.

Personally, I have to thank the Chief Clerk and his staff for the great assistance they have given me in laying before you my frequent reports.

I am indebted also to the Sanitary Aid Association, and to not a few individual amateur inspectors who have sent me information from time to time of things requiring remedy. Such communications I have generally acknowledged at the time, but I should wish to take this opportunity of thanking my many modest friends who send me information of nuisances without telling me their names.

Finally, sir, I have to thank the Committee over which you preside, for the way in which they have supported my action during the year, and yourself especially for the kindly advice you have given me in cases where I have been in doubt, and for the energetic support you have rendered where difficulties had to be overcome.

J. SPOTTISWOODE CAMERON.

BRITISH MUSEUM
30 APR 65

APPENDIX.

TABLE A, Part 1.

Table shewing deaths recorded in the City of Leeds during the fifty-two weeks ended December 30th, 1893, classified according to cause, age, and the registration sub-districts or institutions in which they occurred.

TOWNSHIPS, &c.	LEEDS																				In-firmary, &c.		Fever Hospitals*		WORKHOUSES.								TOTAL Mortality in City.			Annual rate per 1,000 pop.	DEATHS OF			
	North.		West.		South E.		Hunslet.		Holbeck.		Wortley.		Kirkstall		Bramley		Chapel-town.		Whitkirk						Leeds.		Hunslet.		Holbeck		Bramley						Leeds persons occurring outside City.		Out-siders occurring in City.	
Estim. Pop.	62,538		85,622		34,126		60,819		24,196		51,623		32,451		15,645		14,643		431																					
Under and over 5.	und 5	ov 5	und 5	ov. 5	und 5	ov. 5	und 5	v. 5	und 5	ov. 5	und 5	ov. 5	und 5	ov. 5	und 5	ov. 5	und 5	ov. 5	und 5	ov. 5	und 5	ov. 5	und 5	ov. 5	und 5	ov. 5	und 5	ov. 5	und 5	ov. 5	und 5	ov. 5	und 5	ov. 5	all ages		und 5	ov. 5	und 5	ov. 5
Small-pox	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	27	..	..	..	..	..	..	..	..	3	27	31	0·08	..	..	..	1
Measles	45	1	44	3	63	5	84	2	19	1	10	2	24	2	13	1	5	2	..	..	1	1	1	..	12	..	..	..	..	..	..	..	321	20	341	0·90	..	..	2	..
Scarlatina	2	..	2	1	..	..	6	..	..	..	6	3	2	1	..	1	1	..	..	..	..	..	1	5	..	..	..	..	..	..	..	..	20	11	31	0·08	..	..	..	1
Diphtheria	6	2	7	7	2	1	6	3	3	3	..	1	4	1	..	4	2	2	..	..	1	2	1	1	..	..	..	..	..	..	..	..	32	27	59	0·15	..	..	1	..
Croup (not spasmodic)	7	..	10	2	13	..	8	3	6	..	10	3	1	..	1	2	2	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	59	11	70	0·18	..	..	..	..
Whooping-cough	23	..	26	1	24	..	40	..	15	2	11	..	15	..	9	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	164	3	167	0·44	..	..	..	..
Contin. Fevers. Typhus ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	1	1	0·00	..	..	..	..
Enteric ..	2	8	1	10	2	3	..	16	2	7	..	19	..	6	..	2	..	1	..	..	..	3	..	24	..	1	..	..	..	..	..	..	7	100	107	0·28	..	..	..	2
Other or doubtful	..	..	..	..	..	..	..	1	..	..	2	2	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	3	6	0·02	..	..	..	..
Diarrhœa	109	6	97	16	63	3	107	7	49	3	56	11	39	2	18	2	11	4	..	..	2	..	..	..	1	..	..	..	..	..	..	2	552	56	608	1·60	..	..	..	..
Cholera	1	..	2	..	..	..	..	1	..	1	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	4	7	0·02	..	..	..	..
Rheumatic Fever	..	..	..	4	..	2	..	..	..	..	.	1	..	1	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	9	0·02	..	..	..	..
Acute & Sub-acute Rheumatism	..	3	..	1	..	1	..	3	..	..	..	1	..	5	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	15	15	0·04	..	..	..	..
Erysipelas	1	1	4	2	3	1	..	1	1	1	1	..	..	..	..	..	2	..	..	..	..	..	..	..	..	2	1	..	..	..	..	..	13	8	21	0·06	..	..	..	..
Pyæmia	1	4	..	4	..	1	..	2	1	..	..	2	..	1	..	2	..	..	..	..	..	4	..	..	..	..	..	..	..	..	..	..	2	20	22	0·06	..	..	..	2
Puerperal Fever	..	5	..	4	..	1	..	2	..	..	..	3	..	..	..	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	17	17	0·04	..	..	..	..
Ague	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	0·00	..	..	..	..
Phthisis	4	116	3	117	4	52	3	63	1	29	5	72	..	43	..	14	..	14	..	1	1	14	..	2	5	76	..	5	1	2	..	1	27	621	648	1·70	..	..	2	6
Bronchitis Pneumonia Pleurisy	174	126	123	174	124	98	116	121	62	45	64	75	46	59	37	28	12	19	..	..	5	21	1	2	1	31	1	5	..	5	..	3	766	812	1578	4·14	..	..	..	7
Heart Disease	..	68	2	93	..	46	1	51	..	27	..	41	1	40	..	23	..	13	..	2	..	24	..	..	..	32	..	..	..	2	..	3	4	465	469	1·25	..	..	..	8
Injury, &c. ..	5	8	6	20	3	18	7	15	2	4	5	10	2	5	1	9	1	2	..	1	18	69	..	..	..	1	..	1	..	1	..	1	50	165	215	0·56	..	..	2	20
Above causes	380	348	327	459	301	232	378	291	161	123	170	246	135	168	79	89	37	61	..	4	28	138	8	62	19	143	2	11	2	10	..	10	2027	2395	4422	11·62	..	..	7	47
All other causes	355	243	351	434	229	155	364	238	119	114	288	221	125	154	58	68	43	87	2	1	37	185	..	3	21	114	3	31	..	15	3	29	1998	2092	4090	10·74	..	..	9	84
Total under and over 5	735	591	678	893	530	387	742	529	280	237	458	467	260	322	137	157	80	148	2	5	65	323	8	65	40	257	5	42	2	25	3	39	4025	4487			..	..	16	131
Total	1,326		1,571		917		1,271		517		925		582		294		228		7		388		73		297		47		27		42				8512	22·35			147	
Mortality per 1000 per an.	21·28		18·41		26·97		21·04		21·44		17·98		18·00		18·86		15·63		16·30																	22·35				

* Including 24 deaths at Manston (outside the city boundary).

NOTE.—This table differs as to heart disease from the corresponding tables in reports for 1890-91-92. See page 144 and 142 note.

TABLE A, Part 2.

Table of populations, registered births, and mortality at certain ages, in the registration sub-districts.

(Public institutions regarded as sub-districts.)

Population estimated to middle 1893.				382,094	10,850	36,968	85,171	78,585	149,846	8,785	11,889	
REGISTRATION SUB-DISTRICTS OF LEEDS CITY.	Population at all ages.		Registered Births.	Mortality from all causes, at subjoined ages.								Death-rate per 1,000 for each district.
	Census 1891	Estimated to middle of 1893.		At all ages.	Under 1 year.	1 and under 5	5 and under 15	15 and under 25	25 and under 60	60 and under 65	65 and upwards	
Leeds Township—North ..	60,618	62,538	2,233	1,326	469	266	39	56	307	49	140	21·28
Do. do. West ..	83,520	85,622	2,270	1,571	441	237	64	84	367	75	303	18·41
Do. do South-East	33,385	34,126	1,208	917	295	235	31	23	201	45	87	26·97
Hunslet	58,164	60,819	2,193	1,271	479	263	45	55	220	59	150	21·04
Holbeck	23,592	24,196	803	517	164	116	17	14	110	22	74	21·44
Wortley	49,436	51,623	1,653	925	318	140	36	40	202	36	153	17·98
Kirkstall	29,911	32,451	994	582	176	84	22	26	140	29	105	18·00
Bramley	14,787	15,645	462	294	88	49	21	8	51	13	64	18·86
Chapeltown	13,661	14,643	438	228	54	26	13	20	50	12	53	15·63
Whitkirk	431	431	9	7	1	1	..	2	3	..	..	16·30
Infirmary	..	..	..	388	22	43	31	50	205	23	14	..
*Fever Hospitals	..	..	..	73	4	4	13	19	31	..	2	..
Workhouses Leeds ..	..	..	67	297	26	14	6	14	124	24	89	..
Workhouses Hunslet ..	.	..	10	47	3	2	1	..	18	6	17	..
Workhouses Holbeck ..	..	..	3	27	..	2	..	..	6	2	17	..
Workhouses Bramley ..	..	..	5	42	2	1	1	..	14	3	21	..
For the whole City	367,505	382,094	12,348	8,512	2,542	1,483	340	411	2,049	398	1,289	22·35

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* Including the deaths of 24 persons at Manston (outside the city boundary).

TABLE B.

TABLE OF POPULATION, BIRTHS, AND OF NEW CASES OF INFECTIOUS SICKNESS, coming to the knowledge of the Medical Officer of Health, during the 52 weeks of 1893, in the Urban Sanitary District of Leeds; classified according to Diseases, Ages, and Localities.

Names of Localities adopted for the purpose of these Statistics.	Population at all ages.		Registered Births.	Aged under 5, 5 under 15, 15 upwards.	New Cases of Sickness in each Locality, coming to the knowledge of the Medical Officer of Health.													Number of such Cases Removed from their Homes in the several Localities for Treatment in the Isolated Hospital.												
	Census, 1891.	Estimated to middle of 1893.			1	2	3	4	5	6	7	8	9	10	11	12	13	1	2	3	4	5	6	7	8	9	10	11	12	13
									Fevers.													Fevers.								
					Small-pox.	Scarlatina.	Diphtheria.	Membranous Croup.	Typhus.	Enteric or Typhoid.	Continued.	Relapsing.	Puerperal.	Cholera.	Erysipelas.	Other.	TOTAL.	Small pox.	Scarlatina.	Diphtheria.	Membranous Croup.	Typhus.	Enteric or Typhoid.	Continued.	Relapsing.	Puerperal.	Cholera.	Erysipelas.	Other.	TOTAL.
(a)	(b)	(c)	(d)	(e)																										
North (H)	60,618	62,538	2,300	Under 5,	3	13	2	..	..	1	..	..	..	..	..	9	28	3	9	..	..	..	..	..	..	..	..	..	5	17
				5 under 15,	30	37	2	..	..	10	..	..	..	..	..	6	85	30	30	1	..	..	6	..	..	..	..	..	3	70
				15 upwards.	224	11	..	..	1	39	..	..	..	..	..	41	316	223	10	..	..	1	32	..	..	..	..	..	38	304
West	83,520	85,622	2,270	Under 5,	1	11	2	..	..	4	..	..	..	..	..	11	29	1	7	1	..	..	3	..	..	..	..	..	2	14
				5 under 15,	13	60	3	..	..	26	..	..	..	..	..	8	110	13	38	..	..	..	15	..	..	..	..	..	4	70
				15 upwards.	80	19	3	..	..	38	..	..	..	..	..	11	151	77	9	..	..	..	25	..	..	..	..	..	11	122
South-East	33,385	34,126	1,208	Under 5,	2	6	..	..	..	1	..	..	..	..	..	5	14	2	2	..	..	..	..	..	..	..	..	..	4	8
				5 under 15,	10	25	..	..	..	8	..	..	..	..	..	6	49	10	18	..	..	..	5	..	..	..	..	..	5	38
				15 upwards.	62	2	..	..	..	15	..	..	..	..	..	3	82	62	1	..	..	..	13	..	..	..	..	..	3	79
Hunslet	58,164	60,819	2,208	Under 5,	1	5	1	..	..	4	..	..	..	..	..	1	12	1	1	..	..	..	1	..	..	..	..	..	1	4
				5 under 15,	12	8	2	..	..	28	..	..	..	..	..	6	56	11	5	..	..	..	11	..	..	..	..	..	5	32
				15 upwards.	29	2	1	..	..	39	..	..	..	..	..	3	74	29	2	..	..	..	27	..	..	..	..	..	3	61
Holbeck	23,592	24,196	806	Under 5,	2	..	..	..	..	..	..	..	..	..	..	1	3	1	..	..	..	..	..	..	..	..	..	..	1	2
				5 under 15,	..	3	..	..	..	6	..	..	..	..	..	..	9	..	2	..	..	..	2	..	..	..	..	..	..	4
				15 upwards.	18	4	..	..	..	8	..	..	..	..	..	3	33	18	2	..	..	..	7	..	..	..	..	..	1	28
Wortley	49,436	51,623	1,653	Under 5,	2	9	..	..	..	3	..	..	..	..	..	2	16	2	6	..	..	..	1	..	..	..	..	..	1	10
				5 under 15,	5	17	2	..	..	10	..	..	..	..	..	2	36	5	11	..	..	..	7	..	..	..	..	..	1	24
				15 upwards.	35	7	..	..	..	34	..	..	..	..	..	1	77	35	6	..	..	..	17	..	..	..	..	..	1	59
Kirkstall	29,911	32,451	994	Under 5,	..	8	1	..	..	..	..	..	..	..	..	1	10	..	2	..	..	..	..	..	..	..	..	..	1	3
				5 under 15,	1	11	..	..	..	4	..	..	..	..	..	2	18	1	9	..	..	..	..	..	..	..	..	..	2	12
				15 upwards.	16	11	..	..	..	23	..	..	..	..	..	1	51	15	4	..	..	..	10	..	..	..	..	..	1	30
Bramley	14,787	15,645	467	Under 5,	2	3	..	..	..	..	..	..	..	..	..	1	6	2	1	..	..	..	..	..	..	..	..	..	..	3
				5 under 15,	..	14	..	..	..	2	..	..	..	..	..	..	16	..	4	..	..	..	1	..	..	..	..	..	..	5
				15 upwards.	14	1	..	..	..	2	..	..	..	..	..	..	17	14	..	..	..	..	1	..	..	..	..	..	..	15
Chapeltown	13,661	14,643	438	Under 5,	..	5	1	..	..	..	..	..	..	..	..	..	6	..	..	..	..	..	..	..	..	..	..	..	..	..
				5 under 15,	..	19	1	..	..	1	..	..	..	..	..	1	22	..	8	..	..	..	1	..	..	..	..	..	1	10
				15 upwards.	3	5	2	..	..	..	..	..	..	..	..	1	11	2	1	..	..	..	..	..	..	..	..	..	1	4
Whitkirk .. .	431	431	9	Under 5,	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
				5 under 15,	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
				15 upwards.	..	..	..	..	..	1	..	..	..	..	..	..	1	..	..	..	..	..	1	..	..	..	..	..	..	1
Totals	367,505	382,094	12,348	Under 5,	13	60	7	..	..	13	..	..	..	..	..	31	124	12	28	1	..	..	5	..	..	..	..	..	15	61
				5 under 15,	71	194	10	..	..	95	..	..	..	..	..	31	401	70	125	1	..	..	48	..	..	..	..	..	21	265
				15 upwards.	481	62	6	..	1	199	..	..	..	..	..	64	813	475	35	..	..	1	133	..	..	..	..	..	59	703
Grand Total ..	..	..	..	..	565	316	23	..	1	307	..	..	..	..	..	126	1,338	557	188	2	..	1	186	..	..	..	..	..	95	1,029

Notification was not compulsory. The Borough General Fever Hospital (the old House of Recovery) and the Small-pox (Stoney Rock) Hospital were both situated in the district marked H. After April most of the new cases of small-pox were admitted to the wooden hospital or the canvas tents in the grounds at Manston, outside the borough, but close to the boundary (Whitkirk). A few convalescents were sent to the Ivy House Sanatorium, which was about to be given up. This building and the Stoney Rock Hospital were burned down, and since that time all small-pox patients have been sent to Manston. Cases admitted to the Isolation Hospitals from outside the borough are not included in this table.

TABLE C.

Table shewing deaths recorded in the City of Leeds during the fifty-two weeks ended 30th December, 1893, classified according to cause, age, and the registration sub-districts to which the patients belonged. Deaths in institutions allocated to districts to which patients belonged.

TOWNSHIPS, &c.	LEEDS.						Hunslet.		Holbeck.		Wortley.		Kirkstall.		Bramley.		Chapeltown.		Whitkirk.		Deaths of Outsiders occurring in City.		Total Mortality in City.			Annual rate
	North.		West.		South E.																					
Estim. Pop., 382.094	62,538		85,622		34,126		60,819		24,196		51,623		32,451		15,645		14,643		431							per 1,000
Under and over 5	under 5	over 5	under 5	over 5	under 5	over 5	under 5	over 5	under 5	over 5	under 5	over 5	under 5	over 5	under 5	over 5	under 5	over 5	under 5	over 5	under 5	over 5	under 5	over 5	All ages.	living.
Small-pox	2	6	..	5	1	4	..	3	..	1	1	4	..	..	1	2	..	..	..	..	..	1	5	26	31	0·08
Chicken-pox	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1	0·00
Measles	50	2	46	2	66	7	84	2	19	1	10	2	25	2	13	1	6	1	..	..	2	..	321	20	341	0·90
Scarlet Fever	3	2	2	2	..	..	7	..	..	..	5	4	2	1	..	1	1	..	..	..	..	1	20	11	31	0·08
Contin. Fevers. Typhus	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	0·00
Contin. Fevers. Enteric	2	12	1	14	2	8	..	19	2	8	..	23	..	9	..	4	..	1	..	..	..	2	7	100	107	0·28
Contin. Fevers. Other or doubtful	..	..	..	..	..	..	..	1	..	..	2	2	1	..	..	..	..	..	..	..	..	...	3	3	6	0·02
Influenza	..	8	3	11	..	3	1	1	..	1	..	5	1	6	..	1	..	4	..	..	..	1	5	41	46	0·12
Whooping-cough	23	..	26	1	24	..	40	..	15	2	11	..	15	..	8	..	2	..	..	..	..	..	164	3	167	0·44
Diphtheria	6	3	8	7	2	2	6	3	3	3	..	1	4	2	..	4	2	2	..	..	1	..	32	27	59	0·15
Cholera	1	..	2	..	..	..	..	1	..	1	..	..	..	2	..	..	..	..	..	..	..	..	3	4	7	0·02
Diarrhœa, &c.	110	6	98	16	64	3	107	7	49	3	56	13	39	3	18	1	11	4	..	..	..	..	552	56	608	1·60
Ague	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Zoogenous diseases	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Syphilis	8	1	7	1	9	..	4	1	4	..	1	..	1	..	..	..	..	..	..	..	..	..	34	3	37	0·10
Gonorrhœa Stricture of Urethra	..	3	..	..	..	3	..	1	..	..	..	..	..	1	..	..	..	..	..	..	..	2	..	10	10	0·03
Erysipelas	1	3	4	2	3	1	1	1	1	1	1	..	..	..	..	..	2	..	..	..	..	..	13	8	21	0·06
Pyæmia .. (6) Septicæmia .. (16) Phlebitis .. (0)	1	5	..	3	..	1	..	2	1	2	..	2	..	1	..	1	..	2	..	..	..	2	2	20	22	0·06
Puerperal Fever	..	5	..	4	..	1	..	2	..	..	..	3	..	..	..	1	..	1	..	..	..	..	..	17	17	0·04
Parasitic diseases	..	..	..	1	5	..	2	..	1	..	1	..	..	..	..		4	..	..	..	..	..	13	1	14	0·04
Starvation	12	..	7	..	9	..	10	..	4	..	14	..	3	..	..	..	..	..	..	..	1	..	60	..	60	0·16
Alcoholism	..	4	..	3	..	1	..	..	..	..	..	2	..	2	..		..	..	..	..	..	..	..	12	12	0·03
Rheumatic Fever	..	..	..	4	..	2	..	..	..	..	..	1	..	1	..	..	..	1	..	..	..	..	..	9	9	0·02
Acute and Sub-acute Rheumatism	..	3	..	1	..	1	..	3	..	..	..	1	..	5	..		..	1	..	..	..	..	..	15	15	0·04
Rheumatism	..	1	..	2	..	2	..	2	..	4	..	5	..	2	..	3	..	..	..	..	..	1	..	22	22	0·06
Gout	..	1	..	2	..	.	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	4	4	0·01
Rickets	10	..	2	..	7	..	3	..	3	..	2	..	..	..	2	..	2	..	..	..	1	..	32	..	32	0·08
Cancer	..	35	..	60	..	22	..	22	..	10	..	26	..	17	..	10	..	13	..	1	..	13	..	229	229	0·60

TABLE C (*continued*).

TOWNSHIPS, &c.	LEEDS.						Hunslet.		Holbeck.		Wortley.		Kirkstall.		Bramley.		Chapeltown.		Whitkirk.		Deaths of Outsiders occurring in City.		TOTAL Mortality in City.			Annual rate per 1,000 living.
	North.		West.		South E.																					
Under and over 5	under 5	over 5	under 5	over 5	under 5	over 5	under 5	over 5	under 5	over 5	under 5	over 5	under 5	over 5	under 5	over 5	under 5	over 5	under 5	over 5	under 5	over 5	under 5	over 5	all ages.	
Tabes Mesenterica ..	9	1	25	4	7	..	21	..	4	..	7	1	4	..	1	1	1	..	..	..	..	..	79	7	86	0·23
Tub. Meningitis (67) Hydrocephalus (17)	8	4	11	6	5	..	11	4	4	3	6	5	11	1	2	..	1	2	..	..	..	..	59	25	84	0 22
Phthisis	6	158	3	141	5	69	4	68	2	32	5	75	..	43	..	14	..	14	..	1	2	6	27	621	648	1·70
Tub. Peritonitis ..	2	..	3	6	3	1	2	4	..	1	2	1	3	..	..	..	..	2	..	..	..	2	15	17	32	0·08
Other Tuberculous ..	13	6	11	10	6	2	5	3	6	1	14	3	10	2	..	1	..	2	..	..	1	3	66	33	99	0·26
Scrofula	1	1	1	..	4	..	..	1	..	..	1	..	..	1	..	..	..	1	..	..	1	..	8	4	12	0·03
Anæmia	..	3	..	6	..	2	1	1	..	1	..	1	..	1	..	..	..	..	..	..	..	..	1	15	16	0·04
Diabetes, &c.	..	4	..	5	..	3	..	3	..	2	..	3	..	4	..	..	..	2	..	..	..	2	..	28	28	0·07
Premature Birth ..	51	..	64	..	25	..	56	..	16	..	57	..	22	..	8	..	8	..	..	..	..	..	307	..	307	0·81
Malformations and Atelectasis (31)	5	..	15	..	5	..	21	..	4	..	4	..	3	..	4	..	..	..	..	..	..	..	61	..	61	0·16
Old Age..	..	43	..	78	..	27	..	43	..	37	..	37	..	27	..	11	..	19	..	..	..	4	..	326	326	0·86
Brain Disease	..	51	1	51	1	20	4	19	..	5	2	23	..	14	1	5	..	2	..	..	..	7	9	197	206	0·54
Meningitis	7	6	12	4	11	1	24	4	5	2	14	7	3	..	2	1	1	1	..	..	..	..	79	26	105	0·28
Apoplexy	..	20	..	32	..	14	..	38	..	14	..	30	..	9	..	7	..	7	..	..	..	1	..	172	172	0·45
Paralysis	1	21	..	19	..	7	1	7	..	6	..	10	..	11	..	3	..	5	..	..	..	2	2	91	93	0·24
Gen. Paralysis—Insanity ..	..	..	..	1	..	..	..	..	..	..	..	2	..	1	..	1	..	1	..	..	..	1	..	7	7	0·02
Epilepsy	1	1	..	5	..	1	2	5	..	2	..	6	..	5	..	..	..	..	..	..	..	..	3	25	28	0·07
Convulsions	78	3	65	2	56	2	64	1	23	..	48	..	21	1	11	2	4	..	..	..	..	..	370	11	381	1·00
Laryngismus Stridulus	..	..	2	..	1	..	1	..	..	..	2	..	1	..	..	..	..	..	..	..	..	..	7	..	7	0·02
Other Diseases of Nervous System	..	2	..	6	..	2	..	1	..	..	..	2	..	1	..	1	1	..	..	..	..	2	1	17	18	0·05
Dis. of Organs of Special Sense	1	..	..	1	..	1	..	1	..	..	..	1	2	..	..	2	..	2	..	..	..	2	3	10	13	0·03
Endocarditis, &c. ..	..	21	..	31	..	15	..	17	..	4	..	20	..	9	..	4	..	2	..	..	..	2	..	125	125	0·33
Pericarditis	..	1	..	1	..	..	..	..	..	1	..	..	..	..	..	1	..	..	..	..	..	2	..	6	6	0·02
Heart Disease	..	66	2	72	..	42	1	35	..	25	..	27	1	32	..	18	..	11	..	2	..	4	4	334	338	0·89
Angina Pectoris ..	..	1	..	2	..	2	..	2	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	8	8	0·02
Syncope	2	9	..	10	..	1	..	6	..	5	..	3	..	3	..	2	..	..	..	..	..	..	2	39	41	0·11
Aneurism	..	1	..	..	..	2	..	1	..	1	..	..	..	1	..	..	..	..	..	..	..	1	..	7	7	0·02
Other Circulatory ..	..	..	..	7	..	1	..	1	..	..	..	3	..	1	..	..	..	..	..	..	..	..	..	13	13	0·03
Laryngitis	7	2	15	5	4	3	11	2	1	..	1	1	2	..	1	..	3	..	..	..	..	..	45	13	58	0·15
Croup	7	..	10	2	13	..	8	3	7	..	10	3	1	..	1	2	2	1	..	..	..	..	59	11	70	0·18
Bronchitis	104	82	77	128	84	64	65	71	37	24	32	56	37	33	23	15	7	9	..	..	..	1	466	485	951	2·50
Broncho-Pneumonia ..	54	6	30	10	27	16	21	5	20	5	23	..	6	4	6	1	1	1	1	..	..	..	189	48	237	0·62
Pneumonia	18	54	19	36	13	17	31	48	5	18	9	19	3	18	8	10	3	8	..	..	..	4	109	232	341	0·90
Pleuro-Pneumonia ..	1	1	..	6	..	3	..	1	..	..	..	1	..	3	..	..	..	2	..	..	..	..	1	17	18	0·05
Pleurisy..	1	2	1	8	..	3	..	5	..	1	..	2	..	3	..	2	..	1	..	..	..	2	2	29	31	0·08
Other Respiratory ..	3	7	4	6	2	6	4	11	1	1	8	7	..	1	1	..	..	3	.	..	3	3	26	45	71	0·19

TABLE C (*continued*).

TOWNSHIPS, &c.	LEEDS.																						Deaths of Outsiders occurring in City.		TOTAL Mortality in City.			Annual rate per 1,000 living.
	North.		West.		South E.		Hunslet.		Holbeck.		Wortley		Kirkstall.		Bramley.		Chapeltown.		Whitkirk.									
Under and over 5	under 5	over 5	under 5	over 5	under 5	over 5	under 5	over 5	under 5	over 5	under 5	over 5	under 5	over 5	under 5	over 5	under 5	over 5	under 5	over 5			under 5	over 5	under 5	over 5	all ages.	
Stomatitis	3	..	3	..	2	..	..	..	..	1	2	..	1	..	..	..	..	..	..	..			..	..	11	1	12	0·03
Dentition	16	..	32	..	19	..	34	..	19	..	43	..	12	..	6	..	2	..	1	..			..	..	184	..	184	0·48
Tonsillitis, &c. ..	1	1	..	..	..	..	..	..	..	..	1	..	..	..	..	1	1	..	..	..			..	..	1	..	5	0·01
Dis. of Stomach ..	5	4	2	8	..	1	1	4	..	1	6	4	1	4	..	2	2	1	..	..			..	..	17	29	46	0·12
Enteritis	12	..	7	2	3	5	12	4	..	3	1	2	1	3	..	..	1	..	..	..			..	..	37	19	56	0·15
Hernia	..	4	..	3	1	2	..	1	..	..	..	..	..	..	..	2	..	..	..	..			..	7	1	25	26	0·07
Fistula	..	1	..	1	.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	1	..	3	3	0·01
Peritonitis	1	5	1	12	..	4	..	3	..	2	2	5	..	3	1	1	..	..	..	..			..	4	5	39	44	0.12
Ascitis	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..			..	..	..	1	1	0·00
Jaundice	4	1		1	..	..	3	1	2	1	..	1	..	..	2	..	..	..	..	..			..	1	12	6	18	0·05
Cirrhosis	..	9	..	8	..	4	..	9	..	1	..	1	..	3	..	3	..	2	..	..			..	2	..	42	42	0·11
Dis. of Liver	1	1	1	12	..	4	..	6	..	6	1	..	..	2	..	3	..	2	..	..			..	..	3	36	39	0·10
Dis. of Bowels.. ..	4	6	5	11	1	4	..	4	..	3	1	6	..	3	..	1	..	..	..	..			..	..	11	38	49	0·13
Disease of ductless Glands ..	..	..	..	1	..	..	..	2	..	..	..	..	..	1	..	..	..	..	..	..			..	..	..	4	4	0·01
Nephritis	..	10	2	14	..	5	1	9	1	3	1	2	1	3	..	..	..	2	..	..			..	1	6	49	55	0·14
Kidney Disease ..	..	10	1	21	..	9	..	14	..	4	..	5	..	9	..	2	..	2	..	..			..	2	1	79	80	0·21
Albuminuria	..	4	..	3	..	..	..	1	..	2	..	2	..	2	..	1	..	1	..	..			..	..	..	13	13	0·03
Other Urinary	..	1	..	4	..	2	..	1	..	1	..	3	..	2	..	..	..	1	..	..			..	3	..	18	18	0·05
Dis. of Generative Organs ..	1	2	..	6	..	2	..	1	..	2	..	4	..	4	..	..	..	1	..	..			..	3	1	25	26	0·07
Childbirth	1	15	3	13	1	3	2	10	..	3	1	12	1	5	1	3	2	5	..	..			..	..	12	69	81	0·21
Disease of Bones (33) and Joints (13)	1	4	1	13	1	4	..	3	..	3	..	6	..	..	1	1	1	3	..	..			..	4	5	41	46	0·12
Ulcer: Phlegmon (o) ..	..	1	..	5	..	1	..	3	..	..	..	3	..	1	..	1	..	2	..	..			..	1	..	18	18	0·05
Skin Disease	1	..	1	..	1	..	2	..	..	..	1	..	..	..	..	..	..	..	..	..			1	2	7	2	9	0·02
Injury	9	15	9	30	4	22	7	26	6	11	8	16	2	10	2	12	1	2	..	1			2	20	50	165	215	0·56
Lead Poisoning ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..			..	..	..	..	..	..
Mortification	1	..	..	3	1	2	2	3	..	..	1	2	..	..	..	..	..	..	..	..			..	2	5	12	17	0·04
Debility	16	..	17	3	..	1	6	2	5	..	4	..	3	1	2	2	2	1	..	..			..	..	55	10	65	0·17
Marasmus, Atrophy ..	76	..	36	..	53	..	55	1	16	..	44	..	18	..	12	..	5	1	..	..			..	..	315	2	317	0·83
Tumour	1	3	1	7	..	4	1	3	..	1	..	3	1	1	..	1	..	1	..	..			..	1	4	25	29	0·08
Abscess	3	3	4	6	2	2	1	4	..	..	..	5	..	2	..	2	1	1	..	..			1	2	11	27	38	0·10
Other causes	..	..	..	1	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	..			..	..	1	1	2	0·01
Total under 5 and over 5	766	778	705	1,030	553	469	750	597	286	277	466	530	263	342	138	174	80	154	2	5			16	131	4,025	4,487	8,512	.
Total	1,544		1,735		1,022		1,347		563		996		605		312		234		7				147		8,512			22·35
Mortality per 1,000 per annum ..	24·77		20·33		30·05		22·27		23·35		19·36		18·71		20·01		16·04		16·29				..		22·35			..

NOTES TO TABLE C.

This table was printed for the first time in the report for 1892. In it the causes of death are more detailed than in the other tables. They are classified, as in table A, part 1, according as the deaths were those of persons under or over the age of five. All the deaths which occurred in the following public institutions; the Infirmary, the Women's and Children's Hospital, the Borough Fever and Small-pox Hospitals (including Manston), the Leeds, Hunslet, Holbeck, and Bramley Workhouses, have been classified under the districts to which the patients belonged. The 147 deaths of persons who belonged to no district in the borough have been separated, in two columns by themselves, as deaths of outsiders; these deaths are, however, included in the total mortality of the borough.

As far as possible, the order of the Registrar-General has been followed in the arrangement of this table. The horizontal lines correspond with the groups in the Registrar-General's annual report. *Septicæmia* includes deaths from pyæmia (6), phlebitis (0), phagedæna (0), septicæmia (not puerperal) (16). *Parasitic* diseases include one death from hydatid of liver and 13 from thrush. *Starvation* includes scurvy, purpura hæmorrhagica, from which, however, there were no deaths; inanition, malnutrition, &c. (60 deaths), and privation and want of breast milk (0). *Rheumatic Fever*, in reports previous to 1892, had only the deaths ascribed distinctly in those terms to this disease by the medical attendant. Deaths from acute and sub-acute rheumatism had previously been classed under "rheumatism." A separate line has been given, both in table C, table A, and tables 17 and 18, to prevent confusion and enable comparison. "*Rheumatism*" includes chronic rheumatism and disease simply described as rheumatism (v.p. 143). *Anæmia* includes chlorosis, but not leucocythemia; a death from the latter has been referred to diseases of the *ductless glands*. In *malformations* are included cyanosis (7), patent foramen ovale (3), spina bifida (7), atelectasis (31), imperforate anus (0), cleft palate, harelip and other (13) congenital defects.

Brain disease includes deaths registered from such causes as cerebral congestion, cerebral apoplexy, cerebral meningitis, and softening of the brain. *Meningitis* includes both diseases classified as meningitis (105), and spinal (1) meningitis, but not tuberculous. *Apoplexy* includes all apoplexies not otherwise defined. *Paralysis* includes hemiplegia, paraplegia, ataxia, and paralysis. *General paralysis* (6) is included along with insanity, and does not include deaths from "softening of the brain." *Convulsions* includes diseases so certified, and 10 deaths attributed to "fits." Fits of apoplexy, &c., come under other headings. This group will probably require to be re-arranged. I have tried, as far as possible, to keep to the old headings.

Endocarditis, &c., includes valvular disease of the heart. "Heart disease" includes such diseases as hypertrophy, atrophy, fatty degeneration, weak heart, cardiac disease or degeneration and "disease of the heart." *Angina pectoris* includes only those deaths in which the symptom but no disease is stated. *Aneurism* includes all the aneurisms so stated. *Other diseases of the circulatory system* include atheroma. *Other respiratory diseases* include asthma (10), emphysema (8), empyæma (15), pulmonary congestion (32), "lung disease" (6). *Tonsillitis*, &c., includes the death ascribed to pharyngitis of a child under 5 in Chapeltown. *Diseases of the stomach* include dyspepsia, hæmatemesis, gastritis. *Diseases of the bowels* include melœna, ulcer of intestines, obstruction of bowels, strangulation, not due to hernia, intussusception. *Kidney disease* includes deaths from granular kidney (7), Bright's disease (57), other kidney diseases (16), and uræmia (0). *Albuminuria* includes only diseases in which the symptom without any pathological cause was registered. *Diseases of the urinary system* include calculus, hæmaturia, cystitis, and other diseases of the bladder. *Disease of the generative organs* include uterine disease (8), ovarian disease (4), and other diseases of the generative organs, male (11), female (15). *Childbirth* includes all the accidents of parturition, except puerperal fever.

Disease of the bones and joints includes disease of the spinal column, but not, of course, such diseases as spinal sclerosis, which are now referred to disease of the nervous system. A comparison of mortality previous to 1890 is difficult, as the term spinal disease was used to include both diseases of the spinal column and of the spinal marrow. *Abscess* (38) includes cellulitis (3), phlegmon (0), carbuncle (1). *Injury* includes deaths from accident or negligence, homicide, suicide, and execution. All other causes include only diseases which cannot be classed under any of these groups. The death in the West district was ascribed to sciatica, that in Kirkstall to mumps.

TABLE D.

Shewing death-rates from certain causes for the years 1890-1-2, the average of those years, and the corresponding rates for the year 1893.

	SEVEN COMMON ZYMOTICS.										
	Small-pox	Measles.	Scarlatina.	Diph-theria.	Whooping Cough.	" Fever."	Diarrhœa.	All Seven.	Croup.	Phthisis.	Influenza and diseases of the air passages other than consumption.
1890 ... (53 weeks)	0·00	0·27	0·28	0·07	0·50	0·30	0·98	2·39	0·09	1·66	5·6
1891 ... (52 weeks)	0·00	0·71	0·18	0·04	0·41	0·20	0·86	2·41	0·08	1·79	6·1
1892 ... (52 weeks)	0·02	0·20	0·20	0·08	0·42	0·17	1·10	2·18	0·13	1·42	4·5
Death rate for the 157 weeks	*0·01*	*0·39*	*0·22*	*0·06*	*0·44*	*0·22*	*0·98*	*2·33*	*0·10*	*1·62*	*5·4*
1893 ...	0·08	0·89	0·08	0·15	0·44	0·29	1·60	3·53	0·18	1·70	4·6

The above rates as to the years named are calculated upon the population estimated to the middle of the year 1891 according to the rate of increase which existed at the 1881 and 1891 Census. The average of the three years has been calculated out for a period of 157 weeks upon the population estimated to the middle of 1891, and agrees exactly with the average death-rates of the three years.

The rates are calculated upon the number of deaths which were registered as having occurred in Leeds, whether those of outsiders or not; to these were added in 1893 the deaths which occurred in Manston Hospital, although this is outside the city.

TABLE F

Shewing Births, Deaths, from all and certain causes, Home Patients of the Dispensary, admissions to the Fever Hospitals, with some of the Meteorological conditions and the Death Rates from certain causes in Leeds; with the Death Rates from all causes in the 33 large English towns for each of the thirteen weeks ended April 1st, 1893.

1893.		JANUARY.				FEBRUARY.				MARCH.				APL.	
		Jan. 7th.	Jan. 14th.	Jan. 21st.	Jan. 28th.	Feb. 4th.	Feb. 11th.	Feb. 18th.	Feb. 25th.	Mar. 4th.	Mar. 11th.	Mar. 18th.	Mar. 25th.	April 1st.	TOTALS OR AVERAGES.
Total Births	1	223	223	258	257	233	251	249	246	256	239	252	231	227	3,145
Total Deaths	2	254	223	217	175	164	147	136	146	181	161	169	183	156	2,312
Under 1 year	3	46	48	44	32	39	35	25	49	62	52	37	51	31	551
1 to 2 years...........	4	16	28	21	22	19	9	13	18	23	15	20	26	25	255
2 to 5 years...........	5	15	17	18	13	6	12	9	9	12	10	11	17	18	167
5 to 60 years	6	106	67	65	71	68	56	60	43	52	51	63	55	54	811
60 yrs. and upwards	7	71	63	69	37	32	35	29	27	32	33	38	34	28	528
Deaths: Smallpox...	8	......	......	1	......	1	1	......	......	......	1	......	1	3	8
Measles	9	5	13	11	4	9	5	5	9	14	17	13	26	19	150
Scarlet Fever	10	......	......	......	1	2	......	......	1	......	......	1	......	......	5
Diphtheria	11	......	1	2	2	......	......	......	1	2	......	2	1	......	11
Whooping Cough	12	......	3	2	1	2	3	3	2	......	4	1	......	1	22
Typhus Fever......	13	......	......	......	......	......	......	......	......	......	......	......	......	......	....
Enteric Fever......	14	1	......	1	......	2	1	......	......	......	......	1	......	......	6
Other or doubtful	15	......	1	1	......	......	1	......	......	......	......	......	......	......	3
Diarrhœa or Dysent.	16	......	2	2	......	......	......	2	......	1	2	......	......	2	11
All seven...............	17	6	20	20	8	16	11	10	13	17	24	18	28	25	216
Cholera	18	......	......	......	......	......	......	......	......	......	......	......	......	......	....
Croup	19	1	......	1	1	......	1	2	......	1	......	2	4	......	13
Dis. of Resp. System	20	91	79	81	55	44	35	32	32	33	29	39	37	44	631
Influenza...............	21	......	......	2	2	1	4	1	......	1	......	1	1	......	13
Phthisis	22	22	14	12	11	15	13	11	13	10	11	18	13	17	180
Dis. of Circul. System	23	19	13	15	12	10	14	8	11	15	11	10	8	9	155
Violent Deaths	24	11	6	4	8	6	1	5	6	4	1	2	5	2	61
Inquest cases	25	33	19	18	15	11	8	10	10	11	8	10	11	6	170
Deaths in Pub. Inst.	26	26	18	23	20	19	17	16	23	17	14	16	16	12	237
Dispensary ordinary Patients	27	554	582	589	560	470	478	474	528	417	578	574	510	520	6834
Cases admitted to our Hospitals...........	28	22	18	27	22	27	17	15	13	20	14	25	15	23	258
Barom. (inches)	29	30·00	29·88	29·91	29·81	29·80	29·65	29·47	29·26	29·56	30·04	29·63	30·20	29·94	29·72
Attached Ther. °F ...	30	44·85	49·47	51·46	53·38	53·38	52·77	53·00	51·77	52·00	56·15	57·15	58·85	58·08	53·25
Dry bulb...............	31	28·84	36·70	39·38	44·15	44·54	41·92	44·08	37·00	42·23	48·62	43·76	48·07	50·16	42·26
Wet bulb...............	32	28·08	34·53	38·00	42·38	42·46	40·31	41·92	35·85	39·77	45·92	40·62	38·92	45·08	39·53
Humidity	33	88·61	88·01	88·70	86·78	85·16	87·68	84·08	88·40	80·30	82·16	76·78	60·71	68·68	82·00
Mn. of highest reading	34	31·29	38·29	41·43	47·14	47·57	45·00	48·43	41·14	45·71	52·00	50·71	59·43	58·57	46·67
,, lowest ,,	35	25·00	32·71	34·29	38·86	39·71	37·86	38·86	32·57	34·57	42·57	36·71	32·71	36·86	35·64
,, daily range ...	36	6·29	5·58	7·14	8·28	7·86	7·14	9·57	8·57	11·14	9·43	14·00	26·72	21·71	11·03
Total rainfall (inches)	37	0·23	0·04	0·20	0·05	0·65	0·60	0·47	0·45	1·17	0·01	0·16	......	0·29	4·32
Wind Direction ...	38	SW	NW	W	SW	SW	W	SW	NE	W	SW	W	SW	E	....
Wind Force 0-6 ...	39	1	2	2	2	2	4	2	2	2	2	2	1	1	2
Amount of Cloud 0-10	40	......	......	......	......	......	......	......	......	......	......	......	......	......	....
Birth rate (Leeds) ...	41	30·4	30·4	35·2	35·1	31·8	34·3	34·0	33·6	35·0	32·6	34·4	31·5	31·0	33·0
Death rate (Leeds)...	42	34·7	30·4	29·6	23·9	22·4	20·1	18·6	19·9	24·7	22·0	23·1	25·0	21·3	24·3
,, (33 towns)	43	29·2	28·3	24·9	22·2	20·2	19·9	19·2	19·7	20·8	19·6	19·9	20·9	21·2	22·0
D. R. lung dis. (Leeds)	44	12·4	10·8	11·1	7·5	6·0	4·8	4·5	4·4	4·5	4·0	5·3	5·1	6·0	6·6
D. R. measles (Leeds)	45	0·7	1·8	1·5	0·5	1·2	0·7	0·7	1·2	1·9	2·3	1·8	3·6	2·6	1·6

The Dispensary returns are furnished me by the kindness of the resident staff, and have regard to a week ended in each case a day earlier than that given in the heading.

The Meteorological data are compiled from returns sent me by Mr. Crowther. They are uncorrected readings, made at 10 a.m and 4 p.m. The humidity each week is the average of the humidities calculated on each of the thirteen observations of the wet and dry bulbs.

The corrected humidity in Mr. Glaisher's report for the quarter is, for the calendar month of January, 89; February, 90; March, 88. Average, 89.

This part of the table differs in lines 27, 33, and 45 from that printed in the quarterly return. The data given previously in line 40 are left out as they seem unreliable

TABLE F *(continued).*

Shewing Births, Deaths, from all and certain causes, Home Patients of the Dispensary, admissions to the Fever Hospitals, with some of the Meteorological conditions and the Death-rates from certain causes in Leeds; with the Death-rates from all causes in the 33 large English towns for each of the thirteen weeks ended July 1st, 1893.

1893.		APRIL.				MAY.					JUNE.				
		April 8th.	April 15th.	April 22nd.	April 29th.	May 6th.	May 13th.	May 20th.	May 27th.	June 3rd.	June 10th.	June 17th.	June 24th.	July 1st.	TOTALS OR AVERAGES.
Total Births	1	236	256	246	269	211	251	254	237	259	267	263	228	258	3,235
Total Deaths	2	176	182	176	160	158	160	155	137	130	147	116	146	162	2,005
Under 1 year	3	46	48	41	38	36	43	38	39	34	40	30	42	68	543
1 to 2 years	4	29	25	33	22	24	28	21	14	14	22	13	16	10	271
2 to 5 years	5	24	21	13	15	15	14	13	12	9	14	10	12	8	180
5 to 60 years	6	50	60	61	62	52	48	55	44	45	46	43	49	52	667
60 yrs. and upwards	7	27	28	28	23	31	27	28	28	28	25	20	27	24	344
Deaths: Small-pox	8	2	1	3	......	3	......	1	......	1	......	......	......	2	13
Measles	9	16	26	23	19	16	12	10	16	2	6	6	2	3	157
Scarlet Fever	10	......	......	1	1	......	1	......	1	......	......	2	......	1	7
Diphtheria	11	1	1	1	3	......	3	......	1	2	2	2	2	1	19
Whooping-cough	12	6	2	3	1	2	1	......	1	3	4	1	7	3	34
Typhus Fever	13	......	......	......	......	......	......	......	......	......	......	......	......	......	....
Enteric Fever	14	......	......	......	1	1	......	......	2	2	......	......	1	1	8
Other or doubtful	15	......	......	......	......	......	......	......	......	......	......	......	......	......	....
Diarrhœa or Dysent.	16	......	1	2	2	1	2	3	3	1	5	6	8	25	59
All seven	17	25	31	33	27	23	19	14	24	11	17	17	21	36	297
Cholera*	18	......	......	......	......	......	......	......	......	......	......	......	1	......	1
Croup	19	......	5	1	2	2	......	......	......	1	2	......	2	2	17
Dis. of Resp. System	20	33	40	43	39	42	41	31	33	22	24	20	27	26	421
Influenza	21	......	1	......	1	......	......	......	......	......	......	......	......	1	3
Phthisis	22	10	16	8	12	16	13	11	10	15	9	16	10	16	162
Dis. of Circul. System	23	9	12	10	9	3	9	9	12	6	14	7	12	10	122
Violent Deaths	24	8	2	7	1	3	1	6	3	1	7	1	6	3	49
Inquest cases	25	22	5	12	6	5	9	10	6	5	15	5	16	11	127
Deaths in Pub. Inst.	26	25	23	18	12	13	9	17	12	14	15	14	8	15	195
Dispensary ordinary Patients	27	394	583	596	595	539	524	494	306	518	578	556	553	607	6,843
Cases admitted to our Hospitals	28	29	50	36	41	51	29	32	34	17	14	24	22	16	395
Barom. (inches)	29	30·12	30·20	30·01	29·92	30·07	30·24	29·60	29·68	29·89	30·21	30·09	29·59	29·71	29·95
Attached Ther. °F	30	69·77	60·31	60·23	64·23	59·85	64·39	62·85	63·85	61·92	63·77	65·31	67·92	65·23	63·82
Dry bulb	31	50·62	48·23	56·08	59·46	57·23	62·92	57·31	61·31	57·62	62·54	67·38	63·08	64·00	59·06
Wet bulb	32	46·46	43·08	49·92	50·46	51·08	54·38	53·77	54·85	52·69	56·69	60·23	57·77	58·77	53·09
Humidity	33	73·85	64·85	65·46	56·53	66·08	57·71	79·46	64·85	71·62	68·92	65·38	72·46	65·31	67·11
Mn. of highest reading	34	60·14	55·86	62·86	68·29	63·14	71·29	65·43	63·86	63·86	65·29	73·86	69·00	70·29	65·63
,, lowest ,,	35	38·43	37.71	42·71	43·71	44·43	45·86	47·49	48·71	48·57	50·14	50·71	54·43	52·57	46·57
,, daily range	36	21·71	18·15	20·15	24·58	18·71	25·43	17·94	15·15	15·29	15·15	23·15	14·57	17·72	19·06
Total rainfall (inches)	37	0·29	......	0·56	......	0·14	......	......	......	0·60	0·01	......	0·50	0·86	2·96
Wind { Direction	38	SE	SW	SE	SE	SW	NE SE	E SE	W	NE SE	E NE	E	W	SE SW	
Wind { Force 0-6	39	1	1	1	2	2	1	1	1	1	1	0·8	1	1	1·08
Amount of Cloud 0-10	40	......	......	......	......	......	......	......	......	......	......	......	......	......	....
Birth-rate (Leeds)	41	32·2	35·0	33·6	36·7	28·8	34·3	34·7	32·4	35·4	36·5	35·9	31·1	35·2	34·0
Death-rate (Leeds)	42	24·0	24·7	23·8	21·8	21·2	21·8	21·0	18·6	17·6	20·1	15·8	19·9	21·8	20·9
,, (33 towns)	43	20·9	20·8	21·4	19·7	19·8	18·6	18·9	17·5	17·9	18·2	19·4	22·1	22·7	19·8
D.R. lung dis. (Leeds)	44	4·5	5·5	5·9	5·3	5·7	5·6	4·2	4·4	3·0	3·3	2·7	3·7	3·6	4·4
D.R. measles (Leeds)	45	2·2	3·6	3·1	2·6	2·2	1·6	1·4	2·2	0·3	0·8	0·8	0·3	0·4	1·65

The Dispensary returns are furnished me by the kindness of the resident staff, and have regard to a week ended in each case a day earlier than that given in the heading.

The Meteorological data are compiled from returns sent me by Mr. Crowther. They are uncorrected readings, made at 10 a.m and 4 p.m. The humidity each week is the average of the humidities calculated on each of the thirteen observations of the wet and dry bulbs.

The corrected humidity in Mr. Glaisher's report for the quarter is, for the calendar month of April, 73; May, 71; June, 74. Average, 73.

This part of the table differs in line 45 from that printed in the quarterly return. The data given previously in line 40 are left out as they seem unreliable.

* "English Cholera." The case of a child under one year of age.

TABLE F *(continued).*

Showing Births, Deaths, from all and certain causes, Home Patients of the Dispensary, admissions to the Fever Hospitals, with some of the Meteorological conditions and the Death Rates from certain causes in Leeds; with the Death Rates from all causes in the 33 large English towns for each of the thirteen weeks ended September 30th, 1893.

1893.		JULY.				AUGUST.					SEPTEMBER.				TOTALS AND AVERAGES.
		July 8th.	July 15th.	July 22nd.	July 29th.	August 5th.	August 12th.	August 19th.	August 26th.	Sept. 2nd.	Sept. 9th.	Sept. 16th.	Sept. 23rd.	Sept. 30th.	
Total Births	1	226	247	243	232	223	224	265	241	224	257	204	242	243	3,071
Total Deaths	2	158	207	192	161	164	165	173	183	180	167	188	176	170	2,284
Under 1 year	3	62	109	94	78	65	58	70	84	80	66	77	57	53	953
1 to 2 years	4	21	18	7	21	14	19	11	16	16	15	18	12	18	206
2 to 5 years	5	4	6	6	5	13	7	11	8	9	11	14	13	8	115
5 to 60 years	6	40	43	49	34	48	59	53	51	49	46	52	61	62	647
60 yrs. and upwards	7	31	31	36	23	24	22	28	24	26	29	27	33	29	363
Deaths: Smallpox	8	......	......	......	......	......	......	......	......	......	......	......	......	......	....
Measles	9	4	5	2	3	......	1	1	2	4	......	1	1	2	26
Scarlet Fever	10	......	......	......	2	......	......	1	1	......	......	1	......	2	7
Diphtheria	11	......	1	2	1	......	2	3	......	......	2	2	3	1	17
Whooping Cough	12	4	4	1	2	5	3	3	4	......	4	3	2	2	37
Typhus Fever	13	......	......	......	......	......	......	......	......	......	......	......	......	1	1
Enteric Fever	14	2	......	1	......	4	5	2	3	3	7	10	6	6	49
Other or doubtful	15	......	......	......	......	......	......	......	......	......	......	......	......	......	....
Diarrhœa or Dysent.	16	34	61	59	35	34	25	31	54	39	38	33	28	24	495
All seven	17	44	71	65	43	43	36	41	64	46	51	50	40	38	632
Cholera	18	......	......	......	......	......	......	......	1	......	2	1	1	......	5
Croup	19	......	1	......	3	2	......	1	1	......	1	1	3	......	13
Dis. of Resp. System	20	24	14	18	13	20	18	20	14	11	18	24	22	30	246
Influenza	21	......	......	......	......	......	......	......	......	......	......	......	......	......	....
Phthisis	22	7	14	18	9	17	10	19	14	9	4	14	11	17	163
Dis. of Circul. System	23	10	8	8	5	7	7	7	13	10	6	9	14	10	114
Violence	24	7	3	2	2	2	3	4	4	8	4	4	5	6	54
Inquest cases	25	12	5	4	6	7	6	12	14	12	5	12	12	17	124
Deaths in Pub. Inst.	26	11	20	19	16	10	10	15	20	25	10	22	18	23	219
Dispensary Patients	27	503	597	541	563	512	418	593	638	653	913	654	629	546	7,760
Cases admitted to our Hospital	28	11	7	11	9	7	8	11	11	11	24	21	15	26	172
Barom. (inches)	29	29·89	29·66	29·64	29·88	29·69	29·96	29·91	29·76	30·00	29·75	29·99	29·34	29·44	29·76
Attached Ther. °F	30	70·38	67·31	66·38	66·08	66·92	69·77	72·92	65·31	62·99	62·38	58·92	56·85	53·77	64·61
Dry bulb	31	69·00	61·77	63·77	63·38	63·69	71·31	75·15	64·84	63·38	62·85	61·38	54·53	55·08	63·85
Wet bulb	32	61·92	56·85	57·00	57·85	57·31	64·00	67·15	57·84	57·85	57·31	55·08	49·62	51·62	57·80
Humidity	33	66·08	72·55	64·08	69·92	66·77	64·69	63·15	63·69	70·15	69·62	65·54	70·31	78·54	68·08
Mn. of highest reading	34	76·29	66·28	68·29	68·29	67·29	76·14	81·86	68·86	67·57	67·43	65·43	57·86	59·00	68·51
,, lowest ,,	35	54·86	52·57	53·29	53·57	55·00	57·00	61·00	56·00	53·71	53·57	48·14	46·43	46·71	53·22
,, daily range	36	21·43	13·71	15·00	14·72	12·29	19·14	20·86	12·86	13·86	13·86	17·29	11·43	12·29	15·29
Total rainfall (inches)	37	1·45	0·59	0·22	0·48	2·48	0·80	0·07	0·34	0·26	0·52	—	0·17	0·83	8·21
Wind Direction	38	E	N	NW	NW	W SW	WE	W SW	W	NW	NW	NW SE	W	SW	
Wind Force 0-6	39	1	1	1	1	1	0·9	1	1	1	1	1	1	1	1·0
Amount of Cloud	40	......	......	......	......	...	......	......	......	......	......	......	......	......	....
Birth rate (Leeds)	41	30·9	33·7	33·2	31·7	30·4	30·6	36·2	32·9	30·6	35·1	27·9	33·0	33·2	32·3
Death rate (Leeds)	42	21·6	28·3	26·2	22·0	22·4	22·5	23·6	25·0	24·6	22·8	25·7	24·0	23·2	24·0
,, (33 towns)	43	23·8	24·8	25·1	22·6	21·9	20·9	22·8	21·6	20·6	20·1	19·8	19·7	20·2	21·8
D. R. lung dis. (Leeds)	44	3·3	1·9	2·5	1·8	2·7	2·5	2·7	1·9	1·5	2·5	3·3	3·0	4·1	2·6
D. R. influenza (Leeds)	45	......	......	......	......	......	......	......	......	......	......	......	......	......	....

The Dispensary returns are furnished me by the kindness of the resident staff, and have regard to a week ended in each case a day earlier than that given in the heading.

The Meteorological data are compiled from returns sent me by Mr. Crowther. They are uncorrected readings, made at 10 a.m. and 4 p.m. The humidity each week is the average of the humidities calculated in each of the thirteen observations of the wet and dry bulbs.

The corrected humidity in Mr. Glaisher's report for the quarter is, for the calendar month of July, 77; August, 78; September, 78. Average, 78.

Line 27, Sept. 9th, should read 713, not 913, and the total for the quarter 7,560, not 7,760 The page had been stereotyped before the error was discovered.

TABLE F *(continued).*

Showing Births, Deaths, from all and certain causes, Home Patients of the Dispensary, admissions to the Fever Hospitals, with some of the Meteorological conditions and the Death Rates from certain causes in Leeds; with the Death Rates from all causes in the 33 large English towns for each of the thirteen weeks ended December 30th, and the totals for the year 1893.

1893.		OCTOBER.				NOVEMBER.					DECEMBER.					
		Oct. 7th.	Oct. 14th.	Oct. 21st.	Oct. 28th.	Nov. 4th.	Nov. 11th.	Nov. 18th.	Nov. 25th.	Dec. 2nd.	Dec. 9th.	Dec. 16th.	Dec. 23rd.	Dec. 30th.	TOTALS AND AVERAGES.	YEAR.
Total Births	1	214	249	240	225	250	229	211	222	199	196	219	261	182	2,897	12,348
Total Deaths	2	110	138	122	142	127	139	155	178	166	178	173	128	151	1,907	8,512
Under 1 year	3	31	39	32	34	35	51	38	44	33	40	47	33	38	495	2,542
1 to 2 years............	4	10	10	11	11	16	8	17	15	16	14	15	10	14	167	899
2 to 5 years............	5	9	10	7	8	12	11	9	12	10	10	14	3	7	122	584
5 to 60 years	6	36	49	39	52	41	42	60	59	60	81	54	45	53	671	2,800
60 yrs. and upwards	7	24	30	33	37	23	27	31	48	47	33	42	38	39	452	1,687
Deaths: Smallpox...	8	2	......	1	......	......	......	1	......	......	1	1	1	......	7	31
Measles	9	1	1	......	1	3	1	......	......	.. ...	......	......	......	1	8	341
Scarlet Fever	10	......	......	2	......	2	......	2	2	1	......	1	1	1	12	31
Diphtheria	11	1	4	2	......	1	......	2	......	......	......	1	......	1	12	59
Whooping Cough	12	1	3	1	2	4	4	3	9	12	9	14	6	6	74	167
Typhus Fever......	13	......	......	......	......	......	......	......	......	......	......	......	......	......	....	1
Enteric Fever......	14	2	9	8	6	4	6	1	... ..	3	4	2	1	......	46	107
Other or doubtful	15	......	......	......	......	......	......	......	......	......	......	1	......	......	1	6
Diarrhœa or Dysent.	16	8	7	9	7	2	2	3	......	3	1	...	......	1	43	608
All seven...............	17	15	24	23	16	16	13	12	11	19	15	20	9	10	203	1,351
Cholera	18	......	1	......	......	......	......	......	......	......	......	......	......	......	1	7
Croup	19	3	3	......	2	2	2	2	2	2	3	3	2	1	27	70
Dis. of Resp. System	20	12	23	22	23	28	23	41	51	44	59	48	40	42	456	1,753
Influenza...............	21	......	......	......	1	......	......	1	1	6	3	5	8	5	30	46
Phthisis	22	8	9	5	14	7	12	11	11	14	15	8	13	16	143	648
Dis. of Circul. System	23	9	9	9	11	15	8	13	19	11	15	8	9	11	147	538
Violent Deaths	24	5	1	2	6	5	5	5	2	6	4	2	5	3	51	215
Inquest cases	25	10	7	10	15	12	9	13	13	18	10	8	11	10	146	567
Deaths in Pub. Inst.	26	12	18	9	16	10	13	20	14	17	22	15	17	16	199	850
Dispensary ordinary Patients	27	573	540	598	613	508	579	670	551	660	580	524	504	448	7,348	
Cases admitted to our Hospital	28	21	26	24	20	17	17	16	19	10	14	11	18	7	220	1,045
Barom. (inches)	29	29·19	29·68	29·94	29·79	29·66	30·13	29·51	29·87	29·87	29·57	29·44	29·34	30·26	29·71	29.79
Attached Ther. °F...	30	52·23	54·31	58·92	54·23	48·77	46·92	48·38	44·54	49·08	46·77	46·23	47·92	48·17	49·73	57·85
Dry bulb...............	31	51·54	53·85	56·38	51·21	44·88	42·46	43·62	41·23	42·46	44·23	43·61	44·23	42·75	46·34	52·88
Wet bulb...............	32	48·38	50·31	52·76	47·38	41·31	40·38	41·77	39·31	40·23	41·93	41·46	41·31	41·17	43·67	48·52
Humidity	33	79·38	77·69	77·92	75·00	74·69	91·54	86·08	84·14	81·00	83·15	84·08	79·54	88·25	81·7	
Mn. of highest reading	34	55·71	57·43	60·44	54·71	47·86	45·57	46·57	43·27	42·29	47·00	47·29	46·14	45·14	49·18	57·50
,, lowest ,,	35	41·14	45·14	51·59	45·71	38·43	37·14	39·29	34·43	38·57	38·29	33·57	39·86	38·71	40·14	43·89
,, daily range ...	36	14·57	12·29	8·85	9·00	9·43	8·43	7·28	8·84	3·72	8·71	13·72	6·28	6·43	9·04	13·61
Total rainfall (inches)	37	1·21	0·65	0·04	0·34	0·24	0·20	0·43	0·32	0·27	0·55	1·07	0·78	0·24	6·34	21-83
Wind Direction ...	38	W SW	NW	W NW	SW	W SW	NE	SE NE	NW	SW NW	SW	SE SW	SW	SW NW		
Wind Force 0-6 ...	39	1	1	1	2	1	1	1	1	1	1	1	2	1	1·1	1·30
Amount of Cloud 0-10	40	......	......	......	......	......	......	......	......	......	......	......	......	......	....	....
Birth rate (Leeds) ...	41	29·2	34·0	32·8	30·7	34·1	31·3	28·8	30. 3	27·2	26·8	29·9	35·6	24·9	30·4	32·4
Death rate (Leeds)...	42	14·8	18·9	16·5	19·3	17·4	19·0	20·9	24·3	22·7	24·2	23·4	17·5	20·6	19·9	22·4
,, (33 towns)	43	18·5	18·2	18·4	18·3	20·2	21·5	24·0	26·2	26·5	28·6	26·6	24·7	22·6	22·6	21·6
D. R. lung dis. (Leeds)	44	1·6	3·1	3·0	3·1	3·8	3·1	5·6	7.0	6·0	8·1	6·6	5·5	5·7	4·8	4·6
D. R. influenza (Leeds)	45	... ...	......	......	0·1	......	......	0.1	0·1	0·8	0.4	0.7	1·1	0·7	0·3	0·1

The Dispensary returns are furnished me by the kindness of the resident staff, and have regard to a week ended in each case a day earlier than that given in the heading

The Meteorological data are compiled from returns sent me by Mr. Crowther. They are uncorrected readings, made at 10 a.m. and 4 p.m. The humidity each week is the average of the humidities calculated in each of the thirteen observations of the wet and dry bulbs.

The corrected humidity in Mr. Glaisher's report for the quarter is for the calendar month of October, 81; November, 86; December, no return.

The totals for lines 27 and 33 are altered by the corrections referred in notes to other parts of this table. This part had been already stereotyped, but the errors have been struck out. The deleted figures should be 28,585 and 74·72 respectively. For line 40 see previous note.

TABLE F (*continued*).

Showing Births, Deaths, from all and certain causes, Home Patients of the Dispensary, admissions to the Fever Hospitals, with some of the Meteorological conditions and the Death Rates from certain causes in Leeds; with the Death Rates from all causes in the 33 large English towns for each of the thirteen weeks ended March 31st, 1894.

1894.		JANUARY.					FEBRUARY.				MARCH.				TOTALS AND AVERAGES.
		Jan. 6th.	Jan. 13th.	Jan. 20th.	Jan. 27th.	Feb. 3rd.	Feb. 10th.	Feb. 17th.	Feb. 24th.	Mar. 3rd.	Mar. 10th.	Mar. 17th.	Mar. 24th.	Mar. 31st.	
Total Births	1	224	272	222	250	264	262	227	257	281	242	245	284	215	3,245
Total Deaths	2	126	201	157	140	139	138	130	122	142	128	136	141	112	1,812
Under 1 year	3	32	43	26	39	34	42	33	33	37	29	33	45	21	447
1 to 2 years............	4	6	17	12	11	8	11	5	9	12	9	8	8	9	125
2 to 5 years............	5	6	14	10	9	11	9	10	9	4	10	4	11	9	116
5 to 60 years	6	49	74	65	50	53	57	55	43	53	58	57	46	46	706
60 yrs. and upwards	7	33	53	44	31	33	19	27	28	36	22	34	31	27	418
Deaths: Smallpox...	8	......	......	1	......	......	......	......	......	......	1	......	......	......	2
Measles	9	......	......	......	......	......	......	......	......	......	......	......	1	......	1
Scarlet Fever	10	......	1	1	1	......	2	1	......	3	1	1	2	2	15
Diphtheria	11	1	1	2	2	2	1	3	......	1	......	......	2	2	17
Whooping Cough	12	4	11	4	2	3	4	2	6	3	4	4	4	2	53
Typhus Fever......	13	......	......	......	......	......	......	......	......	......	......	......	......	......	....
Enteric Fever......	14	2	1	2	1	2	3	......	......	......	1	......	......	2	14
Other or doubtful	15	......	......	......	......	......	1	......	......	......	......	......	1	......	2
Diarrhœa or Dysent.	16	......	2	......	2	......	2	2	1	......	......	......	2	......	11
All seven...............	17	7	16	10	8	7	13	8	7	7	7	5	12	8	115
Cholera	18	......	......	......	......	......	......	......	......	......	......	......	......	......	....
Croup	19	1	1	3	......	2	3	4	5	1	2	1	2	3	28
Dis. of Resp. System	20	33	46	45	38	28	19	32	34	32	21	28	29	13	398
Influenza...............	21	2	2	2	2	1	2	......	......	......	......	1	......	1	13
Phthisis	22	8	23	12	11	10	9	15	11	10	15	15	11	10	160
Dis. of Circul. System	23	8	15	13	5	14	12	10	7	11	10	10	11	6	132
Violent Deaths	24	6	10	11	9	8	6	4	5	5	2	4	3	6	78
Inquest cases	25	15	24	20	19	17	13	13	10	12	15	10	13	12	193
Deaths in Pub. Inst.	26	19	25	22	14	15	15	14	11	14	19	25	15	25	233
Dispensary ordinary Patients	27	448	322	600	514	475	534	465	385	639	633	552	487	268	6322
Cases admitted to our Hospital	28	11	19	11	14	10	10	11	9	21	18	18	10	6	168
Barom. (inches)	29	30·05	29·72	29·43	29·48	29·51	29·69	29·72	27·97	29·57	29·45	29·40	30·18	29·90	29·54
Attached Ther. °F...	30	40·23	39·46	49·46	46·00	46·00	49·69	45·76	39·60	47·85	47·62	46·70	49·83	45·85	45·70
Dry bulb...............	31	29·23	39·08	45·46	41·38	41·38	47·00	38·69	34·38	45·69	45·92	44·86	49·08	51·31	42·57
Wet bulb...............	32	28·00	37·77	43·31	38·77	38.46	44·23	36·46	32·62	42·08	41·92	40·32	45·17	45·38	39·58
Humidity	33	85·23	90·15	84·15	80·69	78·31	79·69	81·70	83·85	75·08	72·85	69·25	74·92	68·15	78·77
Mn. of highest reading	34	33·00	40·57	47·87	44·57	42·86	49·71	41·43	38·86	49·71	48·29	46·43	55·57	62·14	46·23
,, lowest ,,	35	27·71	30·86	42·59	35·29	35·71	42·14	34·86	25·71	39·43	38·86	36·00	38·43	36·00	35·66
,, daily range ...	36	5·29	9·71	5·28	9·28	7·15	7·57	6·57	13·15	10·28	9·43	10·43	17·14	26·14	10·57
Total rainfall (inches)	37	0·27	0·58	0·74	0·50	0·68	1·57	2·10	0·20	0·58	0·66	0·90	......	......	8·78
Wind Direction ...	38	NE	SE	SW	SW	SW	SW	SE	NW SE	SW W	W SW	NWW	SE	SE	....
Wind Force 0-6 ...	39	1	1	1	2	2	2	1	1	2	1	1	......	......	1
Amount of Cloud 0-10	40	......	......	......	......	......	......	......	......	......	......	......	......	......	....
Birth rate (Leeds) ...	41	30·1	36·5	29·8	33·6	35·4	35·2	30·5	34.5	37·7	32·5	32·9	38·1	28·9	33·50
Death rate (Leeds)...	42	16·9	27·0	21·1	18·8	18·7	18·5	17·5	16·4	19·1	17·2	18·3	18·9	15·0	18·71
,, (33 towns)	43	22·8	28·6	23·2	20·7	20·0	19·1	18·7	20·0	20·5	19·9	19·2	19·8	20·0	20·96
D. R. lung dis. (Leeds)	44	4·4	6·2	6·0	5·1	3·8	2·6	4·3	4.6	4·3	2·8	3·8	3·9	1·7	4·11
D. R. influenza (Leeds)	45	0·3	0·3	0·3	0·3	0·1	0·3	......	......	......	......	0·1	......	0·1	0·1

The Dispensary returns are furnished me by the kindness of the resident staff, and have regard to a week ended in each case a day earlier than that given in the heading.

The Meteorological data are compiled from returns sent me by Mr. Crowther. They are uncorrected readings, made at 10 a.m. and 4 p.m The humidity each week is the average of the humidities calculated in each of the thirteen observations of the wet and dry bulbs.

The corrected humidity in Mr. Glaisher's report for the quarter is, for the calendar month of January, 83; February, 82; March, 75. Average, 80.

Line 29, February 24th, should read 29·97, not 27·97, and the total for the quarter 29·70.

TABLE F *continued).*

Showing Births, Deaths, from all and certain causes, Home Patients of the Dispensary, admissions to the Fever Hospitals, with some of the Meteorological conditions and the Death Rates from certain causes in Leeds; with the Death Rates from all causes in the 33 large English towns for each of the thirteen weeks ended June 30th, 1894.

1894.		APRIL.				MAY.					JUNE.				TOTALS AND AVERAGES.
		April 7th.	April 14th.	April 21st.	April 28th.	May 5th.	May 12th.	May 19th.	May 26th.	June 2nd.	June 9th.	June 16th.	June 23rd.	June 30th.	
Total Births	1	246	235	240	237	259	256	216	276	226	245	249	273	233	3,191
Total Deaths	2	153	122	124	121	121	123	122	138	130	124	116	108	90	1,592
Under 1 year	3	37	29	28	34	33	31	35	42	35	31	30	24	28	417
1 to 2 years...........	4	6	12	8	12	9	11	9	9	2	3	10	7	8	106
2 to 5 years...........	5	18	7	6	6	8	9	13	10	11	13	6	10	7	124
5 to 60 years	6	54	42	53	46	46	40	41	53	53	50	49	42	30	599
60 yrs. and upwards	7	38	32	29	23	25	32	24	24	29	27	21	25	17	346
Deaths: Smallpox...	8	......	......	......	......	......	......	......	......	......	......	......	......	......	....
Measles	9	......	......	......	......	......	1	1	......	2	1	......	3	......	8
Scarlet Fever	10	1	1	2	1	2	1	......	2	1	......	2	......	2	15
Diphtheria	11	3	3	......	1	1	......	1	1	3	1	1	3	2	20
Whooping Cough	12	2	3	3	4	1	6	1	3	3	4	2	4	3	39
Typhus Fever......	13	......	......	......	......	......	......	......	......	......	......	......	......	......	....
Enteric Fever......	14	......	......	......	2	1	1	......	1	......	1	......	1	......	7
Other or doubtful	15	......	......	......	......	......	......	......	......	2	......	......	......	......	2
Diarrhœa or Dysent.	16	......	......	1	......	2	......	1	......	2	2	......	1	......	9
All seven...............	17	6	7	6	8	7	9	4	7	13	9	5	12	7	100
Cholera	18	......	......	......	......	......	......	......	......	......	......	......	......	......	....
Croup	19	2	2	......	1	2	2	2	......	......	1	1	......	1	14
Dis. of Resp. System	20	35	25	30	25	23	27	41	34	27	30	28	19	22	366
Influenza...............	21	......	......	......	1	......	......	......	......	......	......	......	1	1	3
Phthisis	22	15	6	13	12	10	9	9	9	15	11	13	7	7	136
Dis. of Circul. System	23	10	12	9	8	6	11	6	5	14	10	9	9	9	118
Violent Deaths	24	8	3	5	6	5	3	5	11	3	3	1	7	2	62
Inquest cases	25	16	13	11	17	11	9	8	21	13	6	8	10	8	151
Deaths in Pub. Inst.	26	27	16	21	14	14	11	17	18	14	11	14	15	5	197
Dispensary ordinary Patients	27	628	589	621	492	531	395	350	523	568	473	588	537	525	6820
Cases admitted to our Hospital	28	8	10	8	11	16	11	7	4	11	33	25	10	24	178
Barom. (inches)	29	29·89	29·70	29·51	29·54	29·82	29·63	29·98	29·97	29·52	29·70	29·81	29·82	30·15	29·77
Attached Ther. °F ...	30	51·31	52·24	52·32	51·23	52·00	52·54	53·92	49·62	51·38	53·85	57·00	59·46	63·77	53·89
Dry bulb...............	31	50·62	54·00	52·55	51·38	50·77	53·54	52·08	51·85	52·85	54·15	59·31	63·92	69·77	55·14
Wet bulb...............	32	46·77	49·16	47·15	46·55	44·69	47·85	48·00	44·15	47·85	50·54	52·84	56·53	59·53	49·35
Humidity	33	76·23	73·08	68·08	70·38	64·00	66·62	74·38	56·31	70·54	78·77	64·85	61·55	55·08	67·68
Mn. of highest reading	34	56·29	59·00	58·00	56·00	54·57	57·00	58·00	56·43	57·29	56·57	63·14	67·29	74·57	59·54
,, lowest ,,	35	40·71	43·00	43·71	42·57	43·14	44·71	44·71	37·43	41·86	47·71	49·14	50·14	54·14	44·84
,, daily range ...	36	15·58	16·00	14·29	13·43	11·43	12·29	13·29	19·00	15·43	8·86	14·00	17·15	20·43	14·70
Total rainfall (inches)	37	0·37	0·95	1·14	0·60	0·26	0·59	0·28	0·04	0·68	1·45	0·26	0·08	......	6·70
Wind Direction ...	38	ESE	NE SE	NE E	SE	SE W	NW W	SW	NE	NE	NE	N W W	NW SW	SW NE	....
Wind Force 0-6 ...	39	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Amount of Cloud 0-10	40	......	......	......	......	......	......	......	......	......	......	......	......	......	....
Birth rate (Leeds) ...	41	33·0	31·5	32·2	31·8	34·8	34·4	29·0	37.1	30·3	32·9	33·4	36·6	31·3	32·9
Death rate (Leeds)...	42	20·5	16·4	16·6	16·2	16·2	16·5	16·4	18·5	17·5	16·6	15·6	14·5	12·1	16·4
,, (33 towns)	43	19·6	19·3	18·2	18·3	17·2	18·2	17·1	17·7	17·0	16·9	15·9	15·7	15·5	17·4
D. R. lung dis. (Leeds)	44	4·7	3·4	4·0	3·4	3·1	3·6	5·5	4.6	3·6	4·0	3·8	2·6	3·0	3·78
D. R. influenza (Leeds)	45	......	......	......	0·1	......	......	......	......	......	......	......	0·1	0·1	0·03

The Dispensary returns are furnished me by the kindness of the resident staff, and have regard to a week ended in each case a day earlier than that given in the heading.

The Meteorological data are compiled from returns sent me by Mr. Crowther. They are uncorrected readings, made at 10 a.m. and 4 p.m. The humidity each week is the average of the humidities calculated in each of the thirteen observations of the wet and dry bulbs.

The corrected humidity in Mr. Glaisher's report for the quarter is, for the calendar month of April, 77; May, 68; June, 69. Average, 71.

Extract from a memorandum on the apparent increase of zymotic mortality in London after passing of Notification Act, 1889. *

After quoting from Mr. Biddle's letter to the *Times* of April 5th, 1893, in commenting on the words "compulsory notification has only augmented its upward tendency from this terrible disease" the memorandum goes on to state—Diphtheria is often called a new disease. It is only since 1858 that the Registrar-General has given it a separate pigeon hole in his mortality return. Before that time many deaths, which would now be ascribed to diphtheria, were returned under the head of malignant scarlet fever. As knowledge of disease has advanced, the confusion between two quite different diseases has diminished. But although, during late years, diphtheria has been, as a rule, easily distinguished from scarlet fever, there has been a difference of opinion amongst medical men as to whether or not *membranous croup* was not really the same disease as *diphtheria.* The tendency of medical thought has been towards regarding *membranous croup and diphtheria* as, generally speaking, the same disease, and at the same time there has been a growing tendency to displace the old name "*croup*" by the more modern term "*diphtheria.*" While, therefore, it is quite true that the proportion of deaths ascribed to diphtheria in London has been steadily and gradually increasing, and that this increase has continued notwithstanding the adoption of notification for three years, it is equally true, although Mr. Biddle says nothing about it, that the deaths ascribed to croup have been rapidly diminishing, and that if we take the two diseases together, the death-rate in the last period does not shew that marked increase on which Mr. Biddle lays so much stress. *(Here followed table given opposite.)*

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* Prepared for Chairman of Sanitary Committee, for use on February 7th, 1894, at anticipated discussion on adoption of Notification Act.

30 65 APR

(Table from memorandum opposite.)

CROUP AND DIPHTHERIA.

LONDON DEATHS AND DEATH-RATES.

Year.	Deaths from			Death-rates per 1,000.†		
	Croup.	Diphtheria.	Together.	Croup.	Diphtheria.	Both.
1882	873	863	1,736	·226	·223	·449
1883	827	951	1,778	·212	·243	·455
1884*	751	973	1,724	·186	·242	·428
1885	674	896	1,570	·169	·224	·393
1886	523	846	1,369	·130	·210	·339
1887	597	961	1,558	·147	·236	·382
1888	494	1,301	1,795	·120	·317	·437
1889	480	1,588	2,068	·116	·383	·499
1890*	491	1,417	1,908	·115	·333	·448
1891	404	1,361	1,765	·096	·324	·420
1892	277	1,885	2,162	·065	·445	·511

* The years 1884 and 1890 consisted each of 53 registration weeks; the others each of 52. The deaths have been extracted from table 13 Registrar-General's "Annual Summary" for 1892. That for 1893 had not been published at the time.

† The rates were calculated on populations estimated by the method of differences from the census results of 1871-81-91.

ERRATA IN 1892 REPORT.

Page 6, table 1, 1892, for ·43 read ·26 (see 1893 report, p. 4, note); this correction involves corresponding corrections below in same column; p. 7, line 3, for 2·27 read 1·22; p. 75, 6th line from bottom, for 6·01 read 7·01; revised populations make it 7·00; p. 85, table 19—death-rate of South Ward, 24·5; p. 91, line 14, after "in" insert "Hunslet then in;" p. 93, line 20, for 9,410 read 19,410; p. 128, line 3, Handford should be Hanford.

30 APR 65

JOWETT & SOWRY, Printers and Lithographers, 78, Albion Street, Leeds.